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ONE THOUSAND COMPLETE PELVIMETRIES: A RADIOLOGICAL AND OBSTETRICAL ANALYSIS.[1]

By COLIN MACDONALD and SHIRLEY THOMAS,
Melbourne.

FOR the past ten years or so we have been less concerned with the purely mathematical considerations of pelvimetry than with opinions on the merit or demerit of its results, offered by obstetricians in positions to be fully informed thereon. And this viewpoint springs from an inherent caution about expressing processes of the human body in terms of mathematics. Many eminent overseas obstetricians of ripe experience, such as Thoms, Chassar Moir and Munro Kerr, aver that they would not be without pelvimetry. Others, both abroad and in Australia, whose opinions are equally worth while, rarely if ever employ it. They contend that they do not want their fingers or their obstetrical judgement confused by unnecessary mathematics. However, with much of clinical pelvimetry being discarded, it looks as if X-ray pelvimetry, in one form or another, must continue to be employed in Australia, even if less frequently than in America or Britain. The question confronting the radiologist to an Australian women's hospital is how complete must this X-ray mensuration be—a most important consideration, because the more complete the pelvimetric investigation, the more time-consuming and expensive it becomes. For example, is a limited investigation (such as is provided by two films) enough in the great majority of cases, as some maintain? These films are (i) that of the inlet, with the use of Albert's position, with the inlet plane roughly parallel to the table (and perhaps with the use of a Thoms perforated plate), and (ii) an erect lateral view, preferably in the last month of pregnancy.

Much valuable information can be elicited from these two films, particularly the erect lateral view; but they do not give us, at least with any degree of accuracy, (i) the bispinous diameter of the mid-pelvis, (ii) the bituberous diameter of the outlet, or (iii) the subpubic angle. We had therefore early taken the view that with these two films alone X-ray pelvimetry was not complete; but it was not until 1943, when Paul Cave, the English radiologist, published his "vertical-shift precision" method of pelvi-

[1] Read by Dr. Colin Macdonald at a meeting of the Section of Radiology and Radiotherapy with the Section of Obstetrics and Gynæcology, Australasian Medical Congress (British Medical Association), Eighth Session, Melbourne, August 25 to 29, 1952.

metry, that we were able, when using this in conjunction with the older methods, to measure any bone-to-bone diameter of the pelvis, whether of inlet, mid-plane or outlet. Even with these techniques, measurement of the time-honoured outlet diameters appeared to give limited information, worth while obstetrically, about the outlet as a whole. However, in 1947 Peter Allen, of New Zealand, introduced a new concept of outlet measurement, and partly because Thoms wrote in such warm praise of it, we widened the scope of our outlet measurements by including Allen's two new diameters—(i) the symphysis-biparietal diameter, and (ii) the available posterior segment diameter. We knew this complete pelvimetry was elaborate. We knew, too, that it was exceedingly time-consuming; but because of the special opportunities available at the Women's Hospital, Melbourne, and at our Melbourne Radiological Clinic partnership, we considered that, as the first step in the assessment of whether X-ray pelvimetry was worth while in Australia, 1000 subjects should be measured, as accurately and completely as possible, the investigation being regarded as a minor research project. We have been able to carry it out only by the indulgence of the partners in the Radiological Clinic and the colleagues at the Women's Hospital.

The cases have been drawn from both public hospital and private cases in the ratio of 2:1. We have been able to correlate the obstetrical results with the pelvimetric findings in 586 cases. This has been done from the clinical records at the Women's Hospital, and in private practice, by details furnished by the obstetricians. In private, with our pelvimetric reports we send out a form asking the obstetrician to furnish us with the full details of the confinement. This has been acceded to in the majority of our cases, and for such valuable cooperation we offer our warm thanks. Early this year we reached 1000 cases of complete pelvimetry. Of course, in the sixteen years preceding 1943 at the Women's Hospital we had made many estimations of inlet diameters alone; but it is only with the complete pelvimetries that we are here dealing. Not only the pelvimetry but also the checking up with the obstetrical history has been a considerable labour, and our object in presenting these findings today is primarily to elicit whether you think this laborious road is worth the further travelling. Any undue zeal for investigations such as this can easily create a Frankenstein monster, able to disrupt a radiological department by insatiable demands on the time of technicians and radiologists. Our aim has been to evolve a satisfactory technique which reduces time and expense to a minimum. There are sound enough economic grounds for such an attempt, for the modern practice of medicine, such as we enjoy it in this country, could well break down under an insupportable burden of demands made on the ancillary services.

Reasons for Pelvimetric Survey.

Amongst the reasons for undertaking these investigations were the following: (i) to find the limits of normality of all pelvic diameters in those Victorian women who presented for pelvimetry; (ii) to find the percentage of the various pelvic types—for example, android, anthropoid *et cetera*—in these women, and to discover how the type of pelvis influenced labour; (iii) to find the percentage of mid-pelvic and of outlet contractions in these women; and as a development of this to find whether contractions demonstrated radiologically, if not clinically, of mid-pelvis or outlet adversely affect the course of labour.

Similar questions appeared to have been answered in Britain and the United States of America. Our concern was with the Melbourne answers. We emphasize that these 1000 cases were not unselected, and we emphasize, too, that statistics drawn therefrom not only have distinct limitations, but must be subjected to special scrutiny. The great majority of patients had been sent to us for pelvimetry for special reasons. In many individual cases two or more indications were advanced by the obstetrician. The overlap of indications being kept in mind, in this total of 1000 cases the reasons cited were as follows: previous abnormal labour 410 cases, pregnancy in elderly *primigravidæ* 43 cases, head not fixed 107 cases, abnormal presentations 101 cases, clinical suggestion of disproportion other than the foregoing 397 cases, diseased bone conditions 136 cases, other miscellaneous reasons 93 cases, reason unknown 69 cases.

The Pelvic Diameters That Were Measured.

Now what are the diameters we have measured in this series? The inlet diameters measured are the true conjugate, the transverse, the posterior segment and the inclination of the brim. The mid-pelvis diameters are the bispinous, the superior antero-posterior, the inferior antero-posterior, and the posterior segment. The outlet diameters are the bituberous, the posterior segment, the subpubic angle, the symphysis-biparietal distance and the available posterior segment.

Some of the measurements require definition.

At the mid-pelvis the superior antero-posterior diameter is measured from the mid-point of the back of the pubes to the junction of the second and third sacral vertebræ, and the inferior antero-posterior diameter is from the bottom of the pubes to the tip of the last sacral segment. We thought it desirable to measure both these antero-posterior diameters, because not only were they in different levels of the pelvis, but their relationship indicates mathematically the degree of curvature of the sacrum, of use to the obstetrical assessor when the films are not available for his inspection. And, in point of fact, the additional time taken to measure these two diameters instead of one is negligible. The symphysis biparietal distance and the available posterior segment have been introduced by Peter Allen, and before they are defined a word might be said about the outlet generally.

Measurement of the Outlet.

Measurement of the outlet, whether by radiological or clinical means, has always presented certain difficulties and has been relatively neglected. The fœtal head is of no use as a pelvimeter here, and it did seem to us imprudent to assume that in Australia, by contrast with Britain and the United States of America, outlet contraction practically never occurs except in association with inlet contraction. In this connexion it may be mentioned that, apparently because of latter day immigration, the percentage of the different types seen in our department is altering.

When the outlet measurement is attempted by clinical means, because of a lack of definite palpable end-points for the bituberous transverse diameter, the estimation of this dimension may vary considerably when measured by different clinicians, even of wide experience. Radiologically, the usual outlet measurements made are the bituberous, the posterior segment of the sagittal and the subpubic angle. But the bituberous is in fact one of the difficult diameters to measure by any X-ray method, because of the uncertainty on the film of the medial end-points of the ischial tuberosities. These points are subject to a considerable personal factor. We have tried several techniques and have come to the conclusion that the simplest is the most satisfactory—namely, the drawing on the X-ray film of a straight line tangential to the lowest point of each tuberosity and measurement of the distance between these points.

TABLE I.

Percentage of Pelvic Types, 1943 to 1952 (1000 Cases).

Type.	First 500 (December, 1943, to June, 1949).	Second 500 (July, 1949, to February, 1952).
Gynæcoid	72%	65%
Anthropoid	10%	6%
Android	10%	11%
Platypelloid	8%	18%

We can, by X rays, measure the posterior segment distance, the bituberous diameter and the subpubic angle;

but of what value are these findings by themselves? Should they be supplemented by additional measurements? Let us examine the subpubic arch first; the actual angle, as measured from the lower border of the symphysis to the inner border of the ischial tuberosities on either side, is in itself not a complete index of its obstetrical capacity, which would appear to depend in part on the degree of outward curvature of the pubic rami. It was because of these considerations that Allen five years ago advanced a new concept of outlet measurement. As he rightly points out, the two planes of which the outlet is composed cannot be analysed independently; the outlet must be estimated as a functional whole. As is well known, the head, after passing the mid-plane, encounters anteriorly the ischio-pubic arch. The important point then becomes the relationship of the sacral tip to the subpubic arch. If the tip is too close, the head may not be able to pass backwards far enough to negotiate the arch. Conversely, if the sacrum is far enough away, a narrow arch may not obstruct the labour, as the head can emerge posterior to the arch. To implement these ideas, Allen employs two additional calculations: (i) the symphysis-biparietal measurement, and (ii) the available posterior segment distance. The symphysis-biparietal distance is that within which a normal biparietal diameter of the fœtal skull can approach the lower edge of the symphysis measured on the Chassard-Lapine's view. (This projection, in which the subpubic arch is closely approximated to the film, is the only one which gives any reliable representation of the curvature and span of the arch.)

The available posterior segment is the distance between the biparietal diameter and the tip of the last segment of the sacrum, and is obtained by applying the symphysis-biparietal distance to the lateral film. There is no time to go into the actual detail of this particular mensuration—it is fully described in Allen's articles. Allen's experience suggests that the ordinary-sized head will have difficulty in negotiating the outlet if the available posterior segment is less than six centimetres.

Attractive though we find this concept, we have for several reasons—the main one of which is difficulty of mensuration—decided to discontinue its employment.

Certain of the objections to the foregoing do not appear to apply to the concept of Williams and Arthure, which in effect is a modification of Allen's principles. They fit a celluloid semicircle into the subpubic arch, of a diameter of 9·5 centimetres, as opposed to Allen's original 10·0 centimetres, and they describe as the "available antero-posterior diameter" the distance from the anterior margin of the semicircle to the sacro-coccygeal junction. Using mensuration as a basis for the estimation of outlet capacity, they state that if the sum of the bispinous diameter and the available antero-posterior diameter is less than 21 centimetres the outlet must be placed in the contracted group. We are now applying this method to our cases.

Range of the Pelvic Diameters.

There is a wide range in every diameter permitting of a normal labour, and Table II shows the range we found in this particular series.

Of course it can be said that everything depends on the size of the child and its head, and in our checks-up the weight of the baby is always recorded. But it is a different matter estimating the baby's size after birth from estimating it before birth; the clinical ante-natal assessment of a baby's size is, in many cases, only a conjecture.

The real problem of pelvimetry is the estimating of how much any diameter must be below the average before it need be entertained as a factor which may militate against easy delivery. Because of the foregoing wide variations, the wise radiologist will eschew any forecasting. This is the prerogative of his obstetrical colleague. Forecasting in any human activity is naïve without considerable personal experience of the end-results of that activity, and that is why we believe that for pelvimetry to become really worth while, it should be included within the province of the obstetrician. But this implies that the obstetrician must acquaint himself or herself in detail with the entire radiological procedure, both its principles and its practical technique. Until this time arrives, the radiologist of experience in this work will continue to play a part of equal responsibility in a conjoined effort. In our view, the radiologist's function is complete when he draws attention to certain of his pelvimetric findings. Early and grievous discomfiture awaits the radiologist too eager to advance obstetrical predictions. When the pelvimetry shows all diameters to be at or above the average range, one important obstetrical doubt has been resolved, and perhaps pelvimetry serves its least questionable function when it demonstrates that a pelvis, previously under suspicion, is quite normal as to size and shape.

TABLE II.

Range of Diameters with Normal Labours.

Diameter or Angle.	Minimum.	Average.	Maximum.
Inlet:			
True conjugate ..	8·5 centimetres	11·4 centimetres	14·3 centimetres
Transverse	11·7 centimetres	13·2 centimetres	15·4 centimetres
Posterior segment ..	2·7 centimetres	4·6 centimetres	6·9 centimetres
Inclination of brim ..	38°	60°	77°
Mid-pelvis:			
Bispinous	7·9 centimetres	10·4 centimetres	12·6 centimetres
Superior antero-posterior	10·3 centimetres	12·8 centimetres	15·3 centimetres
Inferior antero-posterior	9·6 centimetres	11·8 centimetres	15·0 centimetres
Posterior segment ..	2·1 centimetres	4·6 centimetres	7·0 centimetres
Outlet:			
Bituberous	8·7 centimetres	11·4 centimetres	14·7 centimetres
Posterior segment ..	5·4 centimetres	7·8 centimetres	10·6 centimetres
Subpubic angle ..	65°	83°	104°
Symphysis - biparietal distance.	5·4 centimetres	7·1 centimetres	9·7 centimetres
Available posterior segment.	3·4 centimetres	6·6 centimetres	11·6 centimetres

In this contribution we have no time to describe the most important consideration of pelvic shape, such as curvature of the sacrum, whether the side walls converge or not, and the breadth of the sacro-sciatic notch. Shape does not lend itself to mathematical expression, but attention is certainly drawn to these features in our reports. And they are, of course, seen by the obstetrician to whom the films are invariably sent.

The Assessment of Small Diameters.

Now how has our attitude to small diameters developed as a result of our investigation? In other words, when do we begin to entertain doubts about the adequacy of a pelvis? In this regard, Table II suggests that obstetrical optimism, rather than pessimism, should prevail. If one diameter is three-quarters to one centimetre below the average for that diameter, we call the obstetrician's attention to it, and have termed it "contracted". A "contracted" diameter therefore implies one that is appreciably below the average. Contraction was present in 673 cases (Table III). Being thus forewarned, the obstetrician can be forearmed. It must be emphasized that we do not say that the contraction will cause trouble, but we do draw attention to its existence, and to the part of the pelvis in which this small diameter lies. If a diameter is under the average by less than 0·75 to 1·0 centimetre we generally refer to it as being "a shade under", implying that it will probably be of no account obstetrically. In considering any decreased diameter we always bear in mind the other diameters in the same plane. If these diameters are proportionately increased we are slower to draw attention to the reduction of the first diameter than when all diameters are below the average, because we consider that an increase in one direction may compensate for decrease in another direction. Furthermore, in a diameter like the bispinous, which has well defined end-points, more notice is taken of a small variation than in a diameter like the bituberous, in which the end-points are less definite. If

the subpubic angle is normal, we are slower to comment on a slight reduction in the bituberous diameter than when the subpubic angle is reduced.

Obstetrical Assessment of Pelvimetric Results.

With regard to the assessment of our pelvimetric findings with the obstetrical results, details of the subsequent histories were obtained in 568 cases, and it is on these that we have based our conclusions. Just as it is impossible to equate the biological act of parturition with mathematical formulæ, so pelvimetry *vis-à-vis* obstetrics would appear to defy a pure statistical analysis. There are, of course, so many factors responsible for an abnormal labour, of which pelvic smallness is only one, that we offer our figures knowing full well that no medical statistician could give them his blessing.

Table III.

Pelvic "Contraction", Present in 673 Cases of the Series.

Site of "Contraction".	Incidence.
Inlet alone	12%
Inlet and mid-pelvis / Inlet and outlet	17%
Inlet, mid-pelvis and outlet	28%
Mid-pelvis and/or outlet	43%

The obstetrical results have been gathered from the clinical histories, many of them of necessity brief, and however carefully compiled any obstetrical history may be, we feel that it is inevitably coloured by the personality of its writer, as well, of course, as by his knowledge and experience. Then again, the assessment by one specialist of the significance of certain statements in a history written by one of a different speciality can be a veritable quicksand. It may be that any conclusions we are offering would have been the more convincing had an obstetrician of wide experience dissected these histories for us; and yet, so uncertain may be the written word as a medium of communication of ideas from one individual to another that even had the assistance of such an obstetrician been available, the viewpoint could well have been advanced that the conclusions would have been completely convincing only if every one of these confinements had been carried out by the same obstetrician, having clearly before him, during each labour, the pelvimetric findings. So any deductions we draw herefrom can be classed only as impressions. And yet, when we come to reflect, how infrequently does the intellectual feat of medical diagnosis in general satisfy the canons of trained scientific reasoning? Is it not, as Eric Frecker, of Sydney, has written, most often formed partly by sound reasoning from the available data, and partly from an empiricism ultimately arising from past experience, and unconsciously coloured by personality and environment?

The following abnormalities of confinement, as recorded in the obstetrical histories, were regarded by us as being possibly related to smallness of pelvis, and so were employed in the subsequent tables: (i) Cæsarean section; (ii) destructive operations; (iii) injuries at birth to the child, whether causing neonatal death or not; (iv) "high" or "mid" forceps, or "low" forceps if not of easy application or pull; (v) any difficulty with breech delivery; (vi) prolonged labour, over twenty-four hours (even if apparently caused by inertia); (vii) stillbirth, when death occurred during labour; (viii) fœtal distress or maternal distress, if severe; (ix) excessive moulding of the head.

We know the errors inherent in the following tabulations and offer them well aware that only impressions, rather than conclusions, can be drawn therefrom.

Table IV shows that in this series, patients with the android type of pelvis were most prone to abnormal labours, followed by those with the platypelloid type, though there was, in point of fact, no very appreciable difference between the platypelloid, anthropoid and gynæcoid types.

Our figures (Table V) tend to show (this is the most that can be said): (i) that when the inlet is small the obstetrical outlook is more favourable if the mid-pelvis and outlet are within normal limits; (ii) that when the inlet is normal a small mid-pelvis and/or outlet can adversely affect the course of labour.

It may be that if the fœtal head can negotiate the inlet, vaginal delivery will be possible with a contracted outlet if expert obstetrical hands are available; but sometimes those expert hands are not available, and even when they are, can it be said that there is not an increased risk to the child?

Table IV.

The Relationship between Pelvic Type and Subsequent Labour.

Pelvic Type.	Percentage of Abnormal Labours.
Gynæcoid	41%
Anthropoid	44%
Android	66%
Platypelloid	48%

It seems, therefore, as if a case can be made out for pelvimetry which measures all three planes in the antero-posterior and transverse diameters, the outlook in labour being affected by the capacity of the pelvis as a whole.

We therefore suggest that this range of pelvimetry can be justified: (i) inlet: true conjugate diameter, transverse diameter, posterior segment; (ii) mid-pelvis: bispinous diameter, superior antero-posterior diameter, inferior antero-posterior diameter, posterior segment; (iii) outlet: bituberous diameter, posterior segment, subpubic angle. The actual technique of mensuration is outside the scope of this contribution.

Table V.

Effect of Presence or Absence of Pelvic Contraction on Subsequent Labours.

Site of Contraction.	Percentage of Abnormal Labours.
No contraction present	31%
Inlet alone	48%
Inlet and mid-pelvis / Inlet and outlet	52%
Inlet, mid-pelvis and outlet	69%
Mid-pelvis and/or outlet	44%

Cephalometry.

Cephalometry too is outside this paper. Suffice it to say that in the majority of cases it cannot be as accurate as pelvimetry. The important biparietal and suboccipito-bregmatic diameters can be measured (by means of Cave's "vertical shift" technique) when the position of the head projected on the films is favourable; and frequently in a cephalic presentation, when two views of the head at right angles are presented, the volume of the head at term can be calculated more or less accurately. At one time we used the fœtal-head volume in a prognostication of disproportion by equating this against the volumes represented by the true conjugate and bispinous pelvic diameters, employing certain constants allowed for moulding given by Robert Ball, of New York. The conjugate and the bispinous diameters were employed by us as a result of the work of Ball, because in the majority of cases these are the narrowest of all the pelvic diameters. But we have found Ball's equations unreliable, and so do not use them now. We continue, when practicable, to estimate the volume of the fœtal head, and taking 680 cubic centimetres as the average size at term, describe to the obstetrician a head as being "average", "large" or "small". We do not think it is practicable to forecast in terms of the metric system, as

Ball attempted to do, the amount of moulding that can occur normally. Incidentally it may be added that the optimum time for cephalometry, or pelvicephalometry, is at thirty-eight weeks, and for pelvimetry alone, when the woman is not pregnant. The prediction of the outcome of labour from an equation of the pelvimetric and cephalometric results should be attempted only after the widest circumspection.

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THE TREATMENT OF TETANUS.

By E. G. SAINT,[1] R. A. JOSKE and J. L. STUBBE.[2]

(From the Clinical Research Unit of the Walter and Eliza Hall Institute of Medical Research and the Royal Melbourne Hospital.)

IN Australia tetanus is not a rare infection: in 1951 four patients with severe infections were admitted to the Royal Melbourne Hospital. In past decades the treatment of tetanus has been the subject of bitter disappointment, for it is well known that even heroic doses of antitoxin may be without value once the toxin is fixed in central nervous tissue and florid symptoms have developed. Rothstadt and Wood (1936) for example, noted a mortality rate of 70% in forty-seven patients treated at the Royal Melbourne Hospital between 1922 and 1936. However, there is every reason to hope that the use of multiple antibiotics, early tracheotomy, and the relaxing drugs will materially improve the outlook in this dread disease.

The purpose of this communication is to present recent experience in the treatment of six patients suffering from tetanus, four of whom recovered. Discussing prognosis, Cole (1935) stressed the wide variations in severity of infection and adjured caution in assessing the value of new types of treatment. Although valid statistical comparison of the results of treatment of these six cases cannot be made with those of other observers, it is felt that a study of the results of treatment in individual cases is valuable.

Case Reports.

Case I.

A fifteen-years-old female factory hand was admitted to the Royal Melbourne Hospital on August 1, 1951. Three weeks previously she had cut her finger on a piece of tinplate. Two weeks later she complained of a stiff neck and could not open her mouth.

Examination showed a small infected wound of the middle left finger, neck stiffness, trismus, and slight hypertonicity of the abdominal muscles.

Tetanus antitoxin (150,000 units) was given at once intramuscularly. Penicillin (500,000 units) and phenobarbitone (grains iii) were given six hourly. She was fed by an intragastric drip for the first two days, but after forty-eight hours the rigidity had considerably diminished and only trismus remained, and she was able to get out of bed. "Elixir of Myanesin" (two drachms) given before meals caused sufficient relaxation to enable normal mastication and deglutition.

She was discharged from hospital two weeks after admission.

Summary. This was a very mild case of tetanus (grade I), in which isolated trismus was controlled with oral administration of "Myanesin".

Case II.

A forty-year-old female aboriginal was admitted to a bush hospital on January 6, 1950. Two weeks previously she had received a small scalp wound in a fight. Ten days later she had difficulty in opening her mouth and gradually developed more generalized muscle stiffness.

Examination showed trismus, neck stiffness and severe generalized spasticity. There were no spasms. The chest was clear. No obvious wound of the scalp was seen.

A total of 175,000 units of antitoxin was given immediately. Phenobarbital (grains iii) and atropine (grains 1/100) were given four-hourly and penicillin (250,000 units) six-hourly. She was fed through a Rehfuss tube.

Two days after admission spasticity had increased and she began to have flexor spasms. For a period of forty-eight hours, 25 milligrammes of tubocurarine were given intravenously every two hours. On two occasions transient respiratory paralysis occurred, and the relaxation obtained was intermittent. Antibiotics, barbiturates and tube feeding were continued for two weeks before any muscular relaxation was noted. Thereafter muscle stiffness gradually regressed. Trismus remained until the sixth week, when she was discharged from hospital.

Summary. This was a case of tetanus of moderate severity (grade II) with recovery. Intermittent curare therapy caused a dangerous degree of respiratory paralysis.

Case III.

A twenty-year-old female aboriginal was admitted to a bush hospital on December 2, 1950. She had sustained a small scalp wound which had become infected. Six days later she developed painful muscle spasms, stiff neck and trismus. Her admission to hospital was delayed and tetanic symptoms had been present for at least five days when she was first examined.

Examination showed a small infected scalp wound, trismus and *risus sardonicus*, extreme opisthotonus, and hypertonicity of the trunk and limb muscles. Generalized spasms occurred every five minutes.

Tetanus antitoxin (200,000 units) was given immediately. Under "Pentothal" anæsthesia the wound was excised. Penicillin (500,000 units), atropine (grain 1/100) and phenobarbital (grains iii) were given by injection four-hourly. She was fed through a Rehfuss tube. Tubocurarine (25 milligrammes) was given intravenously four hours after admission, causing muscular relaxation lasting twenty minutes. A similar dose given at two-hourly intervals caused only moderate intermittent relaxation. On two occasions troublesome intercostal paralysis occurred. Coarse crepitations were heard in both lungs and the temperature rose to 106·4° F. She died twelve hours after admission. A limited autopsy showed œdematous lungs with signs of early bronchopneumonia.

Summary. This was a very severe case of tetanus (grade III) seen late in its rapid course; adequate relaxation with tubocurarine was obtained only at the risk of dangerous respiratory paralysis.

Case IV.

A sixty-six-year-old housewife, known to be an alcoholic recluse, was admitted to the Royal Melbourne Hospital on June 3, 1951. Six days previously she had trodden on a nail. Five days later she could not open her mouth and within twenty-four hours she was having severe clonic spasms.

Examination between frequent spasms showed trismus, neck stiffness, and severe generalized hypertonicity. A grossly infected wound of the plantar surface of the right foot was present, with cellulitis extending to the mid-calf. The chest was clear. The systolic blood pressure was 220 millimetres of mercury and the diastolic pressure 110 millimetres.

Under "Pentothal" anæsthesia 100,000 units of antitoxin were given intravenously and 100,000 units intramuscularly. The wound was widely excised. A Rehfuss tube was passed. Penicillin (500,000 units) and 500 milligrammes of chloramphenicol were given six-hourly. Tracheotomy was per-

[1] Aided by a grant from the National Health and Medical Research Council.

[2] Drug Houses of Australia Research Fellow.

TABLE I.

Clinical Features and Results of Treatment in Six Cases of Tetanus.

Case Number	Sex, Age.	Grade of Severity.	Incubation Period. (Days.)	Wound.	Antitoxin. (Units.)	Antibiotic.	Sedative.	Relaxant.	Tracheotomy.	Result.	Comment.
1	F. 15	I	14+	Finger.	150,000	Penicillin.	Phenobarbital, intramuscular.	"Myanesin", oral.	No.	Recovery.	——
2	F. 40	II	14	Scalp.	175,000	Penicillin.	Phenobarbital, intramuscular.	*d*-tubocurarine, intravenous.	No.	Recovery.	——
3	F. 20	III	6	Scalp infected +.	200,000	Penicillin.	Phenobarbital, intramuscular.	*d*-tubocurarine, intravenous.	No.	Death.	Bronchopneumonia, hyperpyrexia.
4	F. 66	III	5	Foot infected +++	200,000	Penicillin, Chloramphenicol.	"Pentothal", intravenous.	"Myanesin", intravenous.	Yes.	Death.	Medullary failure, hyperpyrexia.
5	M. 17	III	7	Finger.	500,000	Penicillin, Streptomycin.	"Pentothal", intravenous; "Nembutal", intravenous.	"Flexedil", intravenous.	Yes.	Recovery.	——
6	F. 67	III	10	Hand.	500,000	Penicillin, Streptomycin.	"Pentothal", intravenous.	"Flaxedil."	Yes.	Recovery.	Bronchopneumonia.

formed four hours after admission. "Myanesin" was used as a relaxant, four grammes in 500 millilitres of 5% glucose in distilled water being given by intravenous drip over four hours. In a second bottle connected to the intravenous tube by a Y-piece, one gramme of "Pentothal" in normal saline was given over approximately six hours. The actual rate was controlled by the minute to minute needs of the patient.

Over the following two days a total of twelve grammes of "Pentothal" and approximately 50 grammes of "Myanesin" were given in this manner. Hæmoglobinuria was not detected. The patient was fed by an intragastric drip. The tracheotomy tube was cleared and secretions of the upper respiratory tract were aspirated every hour. Her bladder was catheterized at intervals. She lay quietly relaxed; respiration was never impaired. Pulse and temperature were only moderately elevated. The lungs remained clear. When everything seemed to be going satisfactorily forty-eight hours after admission she suddenly became pulseless and died. Autopsy was not performed.

Summary. This was a very severe case of tetanus (grade III). Spasms were well controlled by continuous intravenous infusion of "Myanesin". Death may have been due to the effect of tetanus toxin on the medullary centres.

Case V.

A seventeen-year-old boy was admitted to the Royal Melbourne Hospital on April 2, 1952. A week previously he had injured his hand. Three days later he complained of pain and stiffness of the abdominal muscles and legs. Trismus and neck stiffness rapidly developed and on admission he was having frequent clonic spasms.

On admission trismus, neck stiffness, opisthotonus and board-like abdominal rigidity were present. The reflexes were hyperactive. Severe clonic spasms occurred at ten-minute intervals.

Antitoxin (200,000 units) was given immediately and a Rehfuss tube was passed. Under "Pentothal" and pethidine anæsthesia tracheotomy was performed. Penicillin (300,000 units six-hourly) and streptomycin (0·5 gramme six-hourly) were given. Good relaxation without respiratory embarrassment was obtained with intravenous "Flaxedil". In the first few days 120 milligrammes were given in 500 millilitres of glucose (5%) in distilled water every four hours by intravenous transfusion. He was fed by continuous intragastric drip supplying three pints of reinforced milk mixture daily. He was lightly sedated from time to time with four millilitres of 2·5% "Nembutal" given intravenously. Antitoxin (100,000 units) was given intravenously for the first three days after admission. On the eighth day the muscle stiffness increased and the dose of "Flaxedil" was increased to 160 milligrammes four-hourly, but he developed diplopia and dysphagia and the drip was immediately slowed down.

He was allowed to eat by mouth on the tenth day. "Flaxedil" was discontinued and the tracheotomy tube was removed on the fourteenth day. Considerable residual muscle stiffness remained but gradually decreased. A trace of trismus was still present four weeks after admission. He was discharged after five weeks.

At no time were abnormal physical signs heard in the chest. During the illness he lost only four pounds in weight.

Summary. This was a severe case of tetanus (grade III) treated with antibiotics, tracheotomy, "Flaxedil" and intragastric feeding, with complete recovery.

Case VI.

A sixty-seven-years-old housewife was admitted to the Royal Melbourne Hospital on January 17, 1952. Nineteen days previously she had run a splinter into her right hand. A small local abscess had formed which she lanced herself, removing the foreign body. Ten days after the original injury she experienced difficulty in swallowing. Over the ensuing week she developed progressive stiffness of the muscles of the jaw, back and abdomen, and became unable to walk owing to spasticity of the leg muscles.

On examination there were severe neck stiffness, trismus and *risus sardonicus*. Spinal and abdominal muscles were hypertonic. The limbs were spastic and flexor spasms were easily elicited. There was a small healed wound on the dorsum of the right hand. The systolic blood pressure was 170 millimetres of mercury and the diastolic pressure was 110 millimetres. Signs of bronchopneumonia were present with dulness and crepitations at the bases of both lungs.

Morphine and "Sodium Gardenal" were given immediately. Tetanus antitoxin (500,000 units) was given intravenously and intramuscularly; penicillin (1,000,000 units) and streptomycin (0·5 gramme) were given six-hourly. "Flaxedil", 80 milligrammes in 500 millilitres of glucose (5%) in distilled water, was given by continuous intravenous drip each four hours. The other bottle of the Y-tube contained two grammes of "Pentothal" in 500 millilitres of normal saline. This was run in only if the patient was wakeful, distressed or in pain.

A Rehfuss tube was passed and the patient was fed by slow intragastric drip. Three pints of reinforced milk mixture were delivered daily.

Despite the administration of atropine (grain 1/100) six-hourly, mucous secretions in the naso-pharynx were excessive after twenty-four hours, and the patient was in grave danger of developing an overwhelming pulmonary infection. Tracheotomy was performed with immediate relief. The tube was cleared hourly when mucus was aspirated from the trachea and the naso-pharynx.

On the second and third days the patient's condition was well stabilized. The tracheotomy tube was clear and no respiratory difficulties were encountered. She was well relaxed with 40 milligrammes of "Flaxedil" given over four hours. In view of the threat of pneumonia it was considered undesirable to over-sedate her, and only very small and occasional amounts of "Pentothal" were run in from the other limb of the Y-tube.

On the fourth day the pulse rate increased and she developed triple cardiac rhythm. Improvement occurred with intravenously administered digoxin. The "Flaxedil" was stopped for a short period, but the hypertonic state rapidly returned to the point of severe spasms, which were

immediately subdued by the renewed intravenous administration of "Flaxedil".

After the fifth day sedation was no longer necessary. By the ninth day the patient was taking food by mouth. "Flaxedil" was discontinued on the fourteenth day, and, although some slight residual rigidity of the abdominal muscles remained, there were no further spasms. The tracheotomy tube was removed on the seventeenth day. She had now virtually recovered from the effects of tetanus and the only thing which prevented her early discharge from hospital was the presence of a large bedsore. After a partially successful skin graft she was discharged on March 30, 1952. When she was seen again in April the ulcer had nearly healed and she was in excellent health and spirits.

Summary. This was a severe case of tetanus (grade III) in an elderly hypertensive female in whom established bronchopneumonia was an unfavourable prognostic influence. Treatment with antibiotics, tracheotomy and intragastric feeding and "Flaxedil" resulted in complete recovery.

Discussion.

Although four of these patients were admitted to a well-equipped modern hospital, two of them (Cases II and III) were treated in a primitive outback bush hospital. Tetanus may develop with devastating rapidity and it is important to realize that all the therapeutic measures outlined above are applicable even under the most adverse circumstances.

These cases have been graded according to the severity of the infection:

Grade I: The incubation period is long; there is a minimal degree of muscle stiffness; no spasms occur.

Grade II: The incubation period is above seven days; generalized muscular hypertonicity occurs; spasms may develop, but are of late onset. Fatalities occur in this group only in elderly debilitated patients or as a result of complicating pulmonary infection.

Grade III: The incubation period is under seven to ten days; there is a rapid onset of symptoms with the early supervention of severe spasms.

Death in Cases III and IV was not surprising. Both patients were suffering from overwhelming infections; treatment in the younger patient was begun far too late to have any influence on the course of the disease and in the other advanced age, alcoholism, probable arteriosclerosis and a heavily infected wound tipped the scale despite a hopeful initial response. The recovery in Cases V and VI is regarded as an encouraging tribute to planned therapy. In Case V, by any criterion, the infection was exceptionally severe, and in Case VI advanced age and signs of bronchopneumonia might well have contributed to death. It is not considered that success can be attributed to any one particular measure adopted—antitoxin, antibiotics, tracheotomy, the use of this or that relaxant: the important principle was the integrated employment of all forms of treatment designed to inhibit the growth of the causative organism and neutralize its toxin, to maintain a clear airway and to prevent secondary lung infection, to spare the patient physically exhausting spasms, and to maintain over a long illness an optimal level of nutrition. Happily, recent advances in many branches of medical science have contributed to the achievement of these ends.

Antitoxin. How tetanus toxin reaches the central nervous system is still a debatable subject. In their classic experiments Marie and Morax (1903), Meyer and Ransom (1903), and more recently Friedman (1939) produced evidence in favour of centripetal spread via the peripheral and spinal nerve pathways. Abel and his colleagues (1935 and 1936) at the Johns Hopkins Hospital have, however, stoutly maintained that an extraneural mode of spread is more likely. Be this as it may, the severity of a case of tetanus depends on the amount of toxin produced, and the first object of treatment is to neutralize all unfixed toxin. As in diphtheria, early diagnosis is a matter of grave importance and should there be any doubt in the diagnosis of trismus or acute spastic "hysteria" the patient should receive the benefit of the doubt and be given antitoxin in large doses. Preliminary skin testing for sensitivity to horse serum is misplaced caution in these circumstances, for tetanus must be considered as a far greater threat to life than serum sickness.

It is conventional to give at least 200,000 units of antitoxin, half intravenously and half intramuscularly. Dean (1917), Spooner and Cole (1935), and Forbes (1950) have shown that therapeutically active levels of antitoxin are still present in the patient's serum up to five weeks after the administration of these large doses. It is therefore probable that repetition of massive doses is unnecessary, but many physicians prefer to err on the safe side by giving intravenous antitoxin on several successive days.

Treatment of the Wound. It is frequently impossible to find the causative wound, but when it is visible it should be excised after antitoxin has been given. If it is grossly infected the area of the excision should be wide. Cole (1935) has recommended that 50,000 units of antitoxin should be locally injected.

Antibiotics. Robinson (1943) found that penicillin inhibited the growth of *Clostridium tetanus in vitro*, and Buxton and Kurman (1945), Weinstein and Wesselhoeft (1946), and Diaz-Riviera *et alii* (1951) have shown that *Cl. tetanus* disappears from infected wounds within twenty-four hours of the commencement of penicillin therapy. In the later cases of the present series at least 2,000,000 units were given daily. Apart from this specific effect, antibiotics are in the highest degree important in the prevention of pulmonary complications. One or the other of the antibiotic agents active against Gram-negative organisms should be employed in addition to penicillin.

Tracheotomy. This safe and simple procedure is now commonly employed in surgical and medical practice—for example, in the treatment of bulbar poliomyelitis and severe head injuries. Creech, Woodhall and Oschner (1950) have strenuously advocated its use in the management of tetanus. Tracheotomy was done shortly after admission in three of the present cases. In all but the mildest cases of tetanus it is difficult to maintain a good airway, and the inevitable accumulation of infected secretions in the naso-pharynx constitutes a perpetual threat to life. Tracheotomy provides an unobstructed airway, and it is possible to aspirate secretions through the tube from deep in the bronchial tree. Dryness and irritation of the tracheal mucosa may occur, but are of relatively little significance.

Sedation and Relaxants. It has been the practice for many years to control the spasms in tetanus with large doses of barbiturate sedatives. While these may spare the patient considerable anxiety, they undoubtedly increase the risk of pneumonia by depressing the respiratory centre. In our own cases the tendency has been to use short-acting barbiturates (for example, "Pentothal", given by continuous intravenous drip) only in the early stages of treatment.

Fortunately the dangers of over-sedation are reduced by the use of a variety of relaxing drugs. *d*-Tubocurarine, "Flaxedil" and pentamethonium compounds are chemically and pharmacologically related, acting peripherally at the myoneural junction; "Myanesin", on the other hand, has a central action, blocking synapses in the spinal cord (Berger and Bradley, 1947). *d*-Tubocurarine has been used in the treatment of tetanus by Cullen and Quinn (1943), Belfrage (1947), Ory and Grossman (1948), Torrens, Edwards and Wood (1948), Adriani and Oschner (1947). The disadvantages of its use appear to be the short duration of its action and the narrow margin of safety between peripheral relaxation and respiratory paralysis. "Myanesin" has been used by Davison, Ward and Pask (1949), Newhouse, Rochford and Royston (1950), and MacDonald (1949) and others. Several reports of hæmoglobinuria following its use (Pugh and Enderby, 1947; Goodier and Goodhard, 1949) have appeared, but this danger has probably been exaggerated. Alderman (1951) treated eight cases of tetanus without encountering this complication. Decamethonium iodide (Skein, 1950) had the disadvantage of causing respiratory paralysis and the dangerous accumulation of mucus secretions. "Flaxedil"—tris-(triethylaminoethoxy 1 : 2 : 3 : benzene)—appears to have a good margin of safety and has indeed proved to be a

popular relaxant in electro-convulsant therapy. In Cases V and VI "Flaxedil" was put to a severe clinical test by administration in large dosage continuously for two weeks. Not only did it undoubtedly contribute towards the patient's recovery, but respiratory paralysis did not occur despite a satisfactory level of peripheral relaxation. Of the available relaxing drugs, "Flaxedil" would therefore appear at the time of writing to be the one of choice. The precise dose must depend on the degree of hypertonicity present and is largely a question of trial and error. It is best administered dissolved in 5% glucose in distilled water by a slow continuous intravenous drip. The needs of patients varied between 40 and 120 milligrammes over a four-hour period. Prostigmine is a specific antidote to these quaternary ammonium compounds. Although respiratory paralysis was not encountered in these cases, it would seem advisable that patients treated in this manner should be nursed in proximity to a mechanical respirator.

Nutrition. The hypertonicity and spasms of tetanus impose a heavy metabolic burden on the patient, and it is necessary to maintain a level of good nutrition. Continuous intragastric feeding through a Rehfuss tube serves this purpose well. In our patients five pints of a reinforced milk mixture supplying 4000 Calories have been given in twenty-four hours during the acute phase of the illness.

Summary and Conclusions.

Treatment in all but the mildest cases of tetanus consists of an integrated therapeutic attack designed to keep the patient alive while the effects of the toxin on the patient wear off. Considerations of the highest importance are the the neutralization of toxin, suppression of exhausting spasms, the prevention of bronchopneumonia and the maintenance of an optimal state of nutrition. The following measures should be adopted.

1. At least 250,000 units of antitoxin should be given on the patient's admission to hospital, half of this by the intravenous route.

2. Early tracheotomy should be performed as a routine measure.

3. Five hundred thousand units of penicillin and 0·5 gramme of streptomycin should be given every six hours.

4. If a demonstrable wound is present early wide excision should be carried out.

5. Continuous intragastric feeding should be instituted through a Rehfuss tube.

6. Continuous administration of "Flaxedil" should be carried out by the intravenous drip.

7. Minimal sedation with short-acting barbiturates, such as "Pentothal", should be used.

In more severe cases it may be necessary to keep the tracheotomy tube in place for two or more weeks and to continue with the intravenous use of "Flaxedil" for a similar period.

Acknowledgements.

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THE ZINC SULPHATE TURBIDITY TEST IN THE DIFFERENTIAL DIAGNOSIS OF JAUNDICE.

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IN 1947 Kunkel described a simple turbidimetric method for the estimation of serum γ globulin. The simplicity of the method and the availability of the reagents required seemed to indicate that the test had a definite place among the various flocculation tests used in routine clinical laboratories in the diagnosis of liver disease. It also had the advantage of expressing the results in grammes of γ globulin instead of the less satisfactory empirical values of the cephalin flocculation and thymol turbidity tests. Our experience with the test has emphasized its value. It has now been used routinely in our Clinical Research Unit for a period of three years and we have found it to be a valuable aid in diagnosing and following the progress of patients suffering from hepatitis. In a previous paper (Althausen *et alii*, 1951) the test was shown to be the one which most frequently gave an abnormal result in a series of fifteen patients suffering from hæmochromatosis.

The method involves the precipitation of γ globulin as a finely turbid suspension with a solution of zinc sulphate of low ionic strength buffered with barbital and sodium barbital to a pH of approximately 7·6. To 0·1 millilitre of serum are added 6·0 millilitres of reagent. After being allowed to stand for thirty minutes, the suspension is shaken and the degree of turbidity produced is read in a spectrophotometer or photoelectric colorimeter. Turbidity values are expressed as arbitrary units based on the comparative turbidity of a standard suspension of barium sulphate similar to that employed in the estimation of the

[1] Aided by a grant from the National Health and Medical Research Council.

thymol turbidity test (Shank and Hoagland, 1946). If desired, the turbidity unit values can be converted into grammes *per centum* of γ globulin by the use of the formula given by Kunkel, Ahrens and Eisenmenger (1948); Grammes *per centum* γ globulin = (units $\times$ 0·053) + 0·5.

Using electrophoresis, Kunkel and his co-workers have shown that in patients with liver disease the characteristic abnormality in the globulin fraction was an elevation in the γ component. The precipitate obtained with zinc sulphate consists chiefly, but not entirely, of γ globulin. Elevation in γ globulin is not specific for liver disease and may occur in the rheumatic group of diseases and indeed in any chronic infection. Reports in the literature seem to indicate that there is still some disagreement over the values which represent the normal range. Kunkel and his co-workers (1948) obtained values of four to twelve units with an average of eight units in thirty-four normal individuals. Maher, Snell and Mann (1948) found a range of four to nineteen units in 236 blood donors, and Friedman (1951) found a range of two to eight units.

We agree with Friedman (1951) that each laboratory should establish its own series of normal values because of variation in the method of preparing the barium sulphate suspension for the standard curve.

In our laboratory the method suggested by Kunkel was used and a mean of three standardizations finally accepted. No great variation was found between the three estimations.

TABLE I.

Zinc Sulphate Turbidity Test Carried Out on Twenty Sera at 8° C., 20° C. and 25° C. showing that there is no Significant Variation with Temperature.

Case Number.	Turbidity Units.		
	8° C.	20° C.	25° C.
1	33·0	32·2	32·4
2	15·7	15·2	14·5
3	14·7	14·2	13·7
4	19·6	18·3	18·5
5	12·8	12·6	13·6
6	13·2	13·2	12·2
7	19·7	18·2	18·2
8	16·8	17·8	16·3
9	15·7	16·0	15·0
10	16·3	15·6	14·9
11	17·7	17·2	17·2
12	18·8	18·3	17·7
13	22·2	21·9	21·4
14	15·8	14·7	15·8
15	15·8	14·2	16·1
16	19·2	19·0	18·8
17	17·7	17·7	17·7
18	13·4	14·2	13·0
19	12·7	14·0	13·2
20	14·7	13·2	13·6

Normal Range.

Estimations were carried out on sera from 129 normal individuals in order to determine the normal range under conditions existing in this laboratory. Serum was obtained from subjects of varying age groups, ranging from 15 to 82 years. The average value was 11·4 units with a standard deviation of $\pm$ 2·6.

Effect of Temperature Variation.

The effect of temperature on the amount of precipitate formed with the zinc sulphate was studied in twenty individuals, including both normals and patients suffering from infectious hepatitis.

Three suspensions were set up for each individual, and these were allowed to stand at 8° C., 20° C. and 25° C. for half an hour, at the end of which their turbidity was estimated in the photoelectric colorimeter. Results are given in Table I.

The differences obtained were not considered to be significant and it was therefore decided to carry out all estimations at room temperature.

Variation in the pH of the Zinc Sulphate Solution.

Small variations in pH of the buffer solution were found to cause a significant increase in the amount of precipitate obtained in the test. It is probable that this is due to small amounts of β globulin also being precipitated at lower pH values. It is therefore advisable to check the pH value of any fresh buffer solution.

Zinc Sulphate Test for Gamma Globulin as an Aid in the Diagnosis of Jaundice.

The zinc sulphate test was carried out on admission to hospital on the serum of 75 patients suffering from jaundice. Further investigations, aided where indicated by liver biopsy or laparotomy, revealed that 25 had jaundice due to external obstruction by gall-stones or carcinoma of the head of the pancreas, and 50 were suffering from infectious hepatitis.

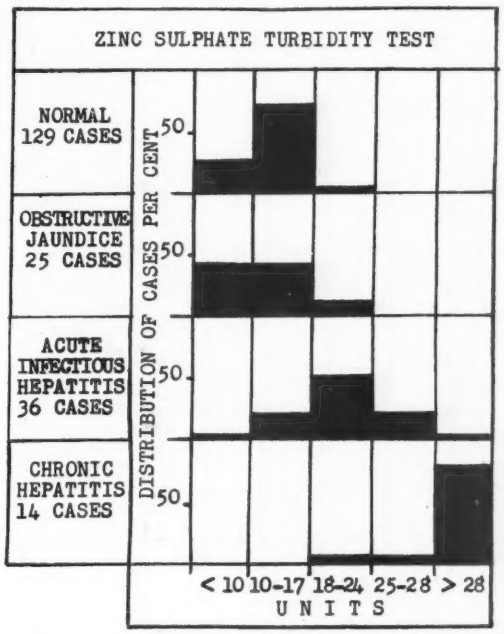

FIGURE I.

Values obtained in the zinc sulphate turbidity test, in normal individuals and in cases of obstructive jaundice, acute infectious hepatitis and chronic hepatitis (either virus or nutritional) showing increased levels in acute infectious hepatitis and a still further rise in the chronic forms.

Those patients with infectious hepatitis gave a mean turbidity value of 23·0 units (standard deviation $\pm$ 5·8) as compared with the 25 patients suffering from obstructive jaundice who gave a mean value of 11·1 units (standard deviation $\pm$ 4·7).

Figure I shows the pronounced increase in γ globulin in acute infectious hepatitis and the still higher values obtained in patients suffering from the chronic form of the disease. Values exceeding 28 units suggested that the disease had entered the chronic phase. One of the striking results, irrespective of whether the ætiology is infectious or nutritional, has been the constant high values obtained in serial tests carried out over periods ranging up to four years.

Value of the Zinc Sulphate Test as an Index of the Progress of Infectious Hepatitis.

The zinc sulphate turbidity test has been of great assistance in following the progress of patients recovering from

infectious hepatitis. It has been our practice to carry out weekly estimations during the patient's stay in hospital. When the γ globulin value did not return to normal there was the possibility that the patient had entered the chronic phase. A persistently high value called for caution in allowing the patient to return to his full physical activity. Figure II shows serial zinc sulphate turbidity estimations made on the serum of a patient suffering from acute infectious hepatitis and one whose illness has entered the chronic phase; both patients ran the usual clinical course and gave typical biochemical findings. It will be noted that the patient with chronic infectious hepatitis had values of over 28 units whilst the other gave a value of 16·5 units on admission to hospital, with a rise to 23 units followed by a return to normal.

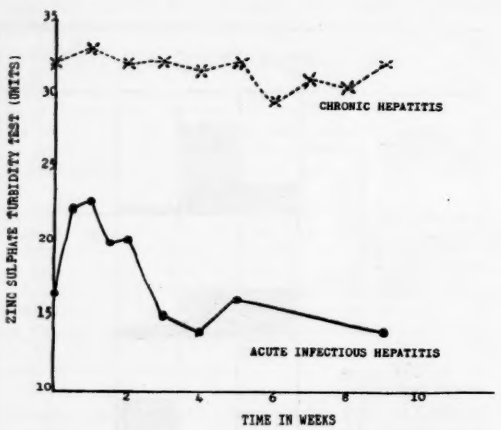

FIGURE II.

Follow-up results obtained in a case of chronic infectious hepatitis (D.T.) and one of acute infectious hepatitis (R.J.) showing the return to normal levels in the acute form of the disease.

Figure III shows the follow-up of values obtained for the serum bilirubin, cephalin flocculation and zinc sulphate turbidity at weekly intervals in a patient suffering from acute infectious hepatitis. The result of the cephalin flocculation test returned to normal before the other two tests. Such serial tests have been carried out on all patients with infectious hepatitis. A return of the zinc sulphate test to normal levels has been a valuable guide in signifying recovery.

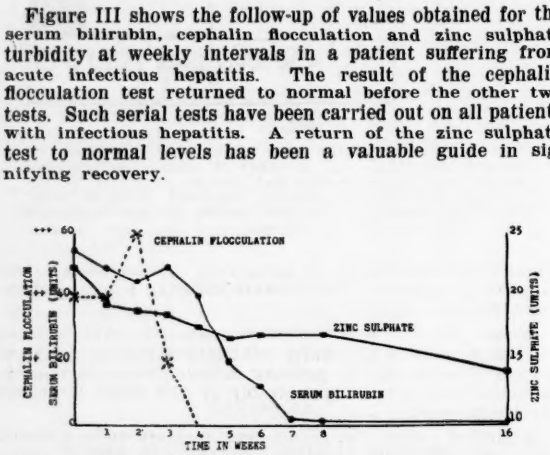

FIGURE III.

Results obtained in the cephalin flocculation, serum bilirubin and zinc sulphate tests at weekly intervals in a case of acute infectious hepatitis (L.D.). The cephalin flocculation test was the first to return to the normal level.

Discussion.

The zinc sulphate test is of considerable value in differentiating the cause of acute jaundice. In acute infectious hepatitis there is stimulation, presumably antigenic, of γ globulin production with resulting high values; this elevation is not seen in obstructive jaundice.

The prolonged elevation of γ globulin during chronic infectious hepatitis suggests a continued antibody response. It is interesting to note that chronic liver disease due to prolonged malnutrition and alcoholism will also give high values for γ globulin. The concentration of γ globulin in the serum may be significantly altered without changes in the level of total protein, albumin or globulin.

Results obtained agree with those of Steigmann *et alii* (1949), who found the zinc sulphate test to be most specific if a normal result was obtained in the presence of jaundice. The normal range obtained agrees with that of Maher, Snell and Mann (1948).

In conclusion it has been found that the test is a valuable aid both in the diagnosis of jaundice and as a guide in management of patients suffering from infectious hepatitis. The availability of the reagents as well as the simplicity of the technique places the test within the range of all routine clinical laboratories.

Summary.

1. The zinc sulphate turbidity test described by Kunkel, Ahrens and Eisenmenger is discussed.

2. The normal value for the test was found to be 11·4 units (standard deviation ± 2·6).

3. In acute infectious hepatitis the average value was 23·0 units (standard deviation ± 5·8) and in obstructive jaundice the average value was 11·1 units (standard deviation ± 4·7).

4. A value exceeding 28 units was usually obtained in chronic hepatitis either of virus or of nutritional origin.

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TEMPORAL LOBE TUMOURS.[1]

By JOHN GAME,
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UNCINATE EPILEPSY (Hughlings Jackson, 1876) and homonymous upper quadrantic field defects (Myer, 1907; Cushing, 1922) are the two main clinical features upon which recognition of temporal lobe tumours has for so long depended.

Having been impressed by the relative frequency with which we have found tumours of these lobes, and with the number of cases in which neither of these features has existed or been recognized, I have undertaken a brief review of 20 recent cases at the Alfred Hospital. Proven cases only have been included; otherwise there has been no selection. There may be some omissions due to defects in the cross-references in the records; but lack of recognition,

[1] Read at a meeting of the Section of Neurology and Psychiatry, Australasian Medical Congress (British Medical Association), Eighth Session, Melbourne, August 25 to 29, 1952.

either before or after death, is not a likely cause of omission, because once admitted to hospital these patients almost invariably die, unless relieved surgically, and there are very few exceptions to routine autopsy examination in the hospital.

Statistics of Incidence.

The estimated incidence of temporal lobe tumours varies widely in published figures, which are few. Alpers (1949), in a recent edition of his text-book, places the temporal lobe next after the frontal lobe as the favourite site of cerebral tumour, and Penfield and Erickson (1941) found that "relative to the volume or mass" of the various lobes, tumour was commonest in the temporal lobes. Unfortunately, the incidence which the present series represents cannot be stated with any accuracy; but over the period of observation it seems to have been at least as high in the temporal lobes as any other lobe.

The ages ranged from thirty-four to seventy years and averaged fifty-four years. Nine tumours were on the left side and 11 on the right. Six tumours were found in the anterior poles of the lobes, seven in the bodies of the lobes, and seven posteriorly.

The predominant pathological type was the glioma, which was found in 16 cases. These tumours were mostly *glioblastoma multiforme*, but even in those not so labelled mitotic figures were frequently observed. Three tumours were meningiomata and one was a secondary carcinoma.

Clinical Features.

The lethal nature of these tumours is made only too clear by the figures for the duration of symptoms before presentation and for the survival periods.

The time during which symptoms had existed before the patient's admission to hospital was more often measured in weeks (ten cases, including one of three days) than in months (six cases). The time could be measured in years in only four cases (two of glioma and two of meningioma).

The survival periods are equally alarming. Only two patients with gliomata survived for more than a few months, and only one for more than a year. Despite a relatively unpleasant pathological report of active cellular glioma, this one patient lived for three years. The two patients who had meningiomata removed are both alive and well, eighteen months and twelve months after their operations respectively.

As uncinate epilepsy and quadrantic field defect are still given pride of place in text-book descriptions of the clinical manifestations of these tumours, their frequency in this series was examined first.

Epilepsy with hallucinatory aura and "dreamy state" was seen in four cases only. Of these patients only one, who had a meningioma of the sphenoid wing indenting the frontal pole of the lobe, had olfactory hallucinations. This same patient, and the three others, had aura of visual hallucinations. (Two of these last three had lesions placed anteriorly in the lobe and two had lesions placed posteriorly in the lobe; the sides varied.)

Thus uncinate epilepsy either did not occur or was not recognized in four-fifths of these cases.

In parentheses it may be appropriate at this point to state the incidence in these cases of other epileptic phenomena not specifically of temporal lobe origin. Some interruption of consciousness was recorded in six, and major epilepsy occurred in three cases only.

The visual fields were examined in 17 cases; on account of their mental state the other three patients were unable to cooperate in the examination, even by crude confrontation methods. Of those 17 tested by one method or another, defects were found in 13, nine having homonymous hemianopia and only four having defects confined to the homonymous upper quadrants. In four cases no defect was found. The value of the clinical record must be doubted in three of these; the fourth was a case of meningioma beneath the posterior end of the lobe.

These figures may be compared with those of Cushing (1922) and Kalodny (1928). Foster Kennedy (1911), in an earlier review in 1911, made no reference to field defects.

For many reasons not comparable, these figures are nevertheless sufficient to reveal that in the majority of cases of temporal lobe tumour no quadrantic field defect is found to aid the diagnosis.

In fact, in this small series of 20 cases, 15 patients showed neither epileptic features of localizing value nor field defect of the type to localize the tumour in the temporal lobes.

TABLE I.

Series.	Number of Cases.	Homonymous Field Defect of Some Sort.	Quadrantic Defect.
Cushing	59	33	25[1]
Kalodny	38	7	1
Present series	20	9	4

[1] "Defects *more or less quadrantic* in character . . . or homonymous defect which fell short of a complete hemianopia."

There being no other clinical features of unequivocal value in localization, it is clear that special methods of investigation are very important, if they can show the site of the lesion.

Eighteen of these 20 cases were correctly diagnosed before or at operation. In 12 cases the existence of tumour in the temporal lobe was demonstrated before operation, and in six more cases less accurate localization in the correct hemisphere was achieved before operation. In two cases no diagnosis of tumour was made, and the patients died without operation.

The most important methods of mechanical investigation depend upon contrast radiography. With the use of air as the contrast medium, the correct localization of temporal lobe tumours is difficult unless the special and very precise procedures described so excellently by Lindgren (1948) are followed. There are two reasons why these special temporal horn studies are necessary. Firstly, the normal "routine" methods often do not fill the horns adequately, and even when filled they are not easily visualized in three dimensions in films taken in the usual standard positions. The second and equally important reason is that Lindgren's technique will reveal the existence of tumours, some benign, when there is no lateral shift of the *septum pellucidum* or distortion of other parts of the ventricular system. In fact, in two of our cases this feature was present. In one the small displacement of the temporal horn was considered insufficient for a diagnosis, and the patient died, her tumour being discovered at autopsy.

Cerebral angiography is at its best as a "localizer" in the temporal lobe. In this series it gave definite and correct localization, and usually revealed the correct pathology too, in the six cases in which it was used.

Electroencephalography gave evidence of a destructive lesion and correct localization in the only three cases in which it was used in this series.

Discussion has thus far been confined to those manifestations of temporal lobe tumours which have absolute value in disclosing their existence, site and nature. It has been revealed that clinical features of reasonably certain localizing value were found in only about one-quarter of the cases, but special aids increased this number to three-fifths, and exploratory craniotomy raised it still further to nine-tenths.

It therefore becomes important to ask what led to the use of these more complex and expensive methods in the 15 cases in which there were no clinical criteria of temporal lobe tumour.

Stated briefly, temporal lobe tumour may possibly exist in any case of cerebral disease with or without raised intracranial pressure and with or without focal motor signs or field defect, especially if the symptoms have been of

recent onset. The probability is increased considerably if there is headache, pyramidal signs or papillœdema, in this order of frequency. Obviously a clinical syndrome so widely defined may be caused by an equally wide variety of pathological lesions—space-occupying lesions of all kinds, and other types of focal and diffuse disease of the brain. The investigation of all such cases, fortunately, follows the same general principles.

One's intention here is to demonstrate that tumour in the temporal lobe, "*par excellence* the silent area" of the brain (Byrom Bramwell, 1899), is by no means a rare cause.

Awareness of this fact and the judicious use of the techniques specially designed to reveal temporal lobe tumours will aid their detection. The stealthy development of these tumours and their ruinous climax put them on a par with subdural hæmatoma for treachery.

Rail, in a paper read at the same session of Congress, has stressed the other side of the picture—the relatively infrequent finding of temporal lobe tumours in patients who present classical temporal lobe epilepsy. This has also been our experience at the Alfred Hospital; but we have been wary of assuming a tumour to be absent without full-scale investigations.

These generalizations have been based upon analysis of all the other observed and recorded clinical features of these 20 cases. There is time only to refer to some of the facts.

Headache occurred in all of them, 17 patients had pyramidal signs and 10 patients had papillœdema. Speech defects existed in six of the nine cases of left-sided tumour.

Cerebro-spinal fluid pressure varied from normal to "over 300" millimetres, and its protein content from 40 to 300 milligrammes *per centum*. The number of cells varied from none to 170 per cubic millimetre, mostly lymphocytes; but in one case of astrocytoma polymorphonuclear cells predominated (28 polymorphonuclear cells to four lymphocytes).

The other details of this analysis need not be laboured here.

That no reference has yet been made to the mental state of these patients is not likely to pass unnoticed by this audience. What may have been expected to be a fertile field for inquiry has proved particularly barren, despite a hopeful, though modest, interest in this aspect.

The fact is that the disintegration of personality and intellect accompanied rather than preceded the rapid medical deterioration of these patients.

Their diagnosis and management thus demanded priority and was frequently a matter of urgency. Specific inquiry frequently revealed that if mental and personality changes did precede the somatic symptoms, they escaped the notice of the relatives. Some emphasis is added to these observations by recalling that none of the patients had first sought the assistance of, or been sent to, a psychiatrist—a sequence of events which happens more often with tumours of the frontal lobes.

Stated in the terms of Bleuler (1951), whose views are derived from the study of 600 tumour patients and appeal as being practical and consistent with current experience and maturing views of cerebral localization, clouding of consciousness was a much more common observation than the chronic amnestic syndrome. Three patients had episodes of acute delirium. Emotional changes were noted in six patients, and in one of these episodes of unaccountable and indefinable fear were experienced, these lasting far longer than the usual psychical epileptic phenomena.

These observations suggest that the mental changes in patients with temporal lobe tumours generally differ in no important way from those in patients with frontal lobe tumours, except in their speed of onset; they are not necessarily "late" symptoms as Walshe (1931) states, but it is their rapid progress coincidental with the rapid physical decline which characterizes them. This may be more related to the rate of growth of the tumours which cause them and to their mechanical relationships, than to the functional properties of the lobe involved. However, there is no intention hereby to imply that the functions of the frontal and temporal lobes are the same or similar.

Professor Le Gros Clark (1948) has drawn our attention to the fact that "in contrast with most other areas the temporal cortex (except for the auditory area) shares with the insular cortex the distinction of having no apparent projection systems from the thalamus but being linked directly or indirectly with the association-fibre systems of other areas of the cerebral cortex, receives the resultants of cortical activity as a whole". Phylogenetically it is the temporal lobe, and not the frontal lobe, which shows the highest development in man as compared with the lower animals. In two interesting papers, the first by Denis Hill (1944) and the second by Rey, Pond and Evans (1949), these facts have been linked with observations of behaviour and certain epileptic and "near-epileptic" phenomena in patients showing evidence of temporal lobe disease, and the theory has been put forward that maturation of these lobes is important to the maturation of adult behaviour and personality. This is in accord with their own and others' electrocencephalographic evidence.

As yet barely beyond the speculative stage, these interesting observations suggest that study of the clinical disorders of the temporal lobe may throw light upon an important facet of the cerebral functions which find expression in the unity of the normal personality.

Thus, although its immediate practical value is often questioned, it is believed that useful knowledge can accrue from the psychometric and psychological study of patients with cerebral disease. In some centres it has already also become a useful instrument in the hands of the clinician, since the early detection of intellectual disintegration may be the first evidence of incipient cerebral disease. Although for the reason stated patients with tumour of the temporal lobe are mostly unsuitable for such study, the method can equally well be applied to those with less rapidly destructive lesions. Applied to the parietal lobe the method has in recent years yielded useful data from which writers such as Russell Brain have constructed tangible concepts of parietal function as related to human consciousness.

Summary.

Temporal lobe tumours are relatively frequent and often rapidly fatal, seldom producing symptoms or signs by which they can with certainty be recognized.

If suspected, the majority can be detected by special methods of investigation. The associated disturbances of personality and intellect have not yet been shown to have any specific features.

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MEDICAL SELECTION OF MIGRANTS FROM THE DISPLACED PERSON POPULATION OF POST-WAR EUROPE.

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AT the close of the Second World War there were nearly 8,000,000 refugees in Europe alone.[1] Soon after the outbreak of hostilities inhabitants of countries overrun by the Germans were, willingly or forcibly, moved to Germany for farm, factory or other work in order to free more Germans for the *Wehrmacht*, or for detention in the many concentration camps. Later, many others fled the Russo-German war zones into Germany. Approximately 7,000,000 people were repatriated by the end of 1946, an estimated 1,600,000 people being left; they were mainly of Baltic and eastern European origin, and for various reasons objected to repatriation. Some became absorbed into the German economy, but the majority, together with post-war refugees seeking sanctuary in western Germany, formed an enormous homeless group of refugees, later termed "displaced persons".

The welfare of these people, particularly with regard to feeding and housing, created many problems, as Germany had suffered extensive war damage. Relief was undertaken by the United Nations Relief and Rehabilitation Administration (U.N.R.R.A.), which entered Germany under the S.H.A.E.F. agreement of November, 1944;[2] food and medical care were supplied, and housing was met by the use of former German army barracks and detention camps. By July, 1947, for the camp population of approximately 559,000 persons,[3] the rations of food were just above subsistence level, with a minimum average daily ration of 2129 Calories, camp accommodation was adequate, hospitals were established, immunization programmes were carried out, and health standards in displaced person camps were reasonably good.[4] By July 1, 1948, the birth rate for this group was 31 per 1000, the death rate only 4·46 per 1000, and the infant mortality rate was 61 per 1000.[5]

On July 1, 1947, the welfare of displaced persons was taken over by the Preparatory Commission of the International Refugee Organization (P.C.I.R.O.). On July 21, 1947, an agreement between the Government of the Commonwealth of Australia and the P.C.I.R.O., covering the entry into Australia of refugees and displaced persons, was signed at Geneva on behalf of the Commonwealth Government by the Honourable A. A. Calwell. Conditions of living in displaced persons camps have been described well by Tronchin-James (1950),[6] and mentioned in a paper by Sir Arthur Rucker (1949).[5]

Medical Selection by the International Refugee Organization.

Because of the fact that countries participating in resettlement programmes desired to accept only healthy immigrants, a provisional order covering the medical examination of resettlement candidates was issued from P.C.I.R.O. Headquarters, Geneva, in December, 1947, and this provided for medical survey at three stages. (i) Displaced persons were transferred from outlying camps to larger "assembly centres", where P.C.I.R.O. employed refugee doctors carried out a preliminary examination. (ii) Subsequently, those who were considered healthy were sent to larger camps, or "resettlement centres", where they were documented and further medically examined, this latter examination including a blood Wassermann test and radiological examination of the chest of all candidates over the age of two years. The findings were then checked by a medical board presided over by an internationally recruited P.C.I.R.O. medical officer. (Stages (i) and (ii) will be later referred to as the I.R.O. examinations.) (iii) Finally an over-all examination was conducted by the medical officer appointed by the country concerned, termed the "selection mission medical officer".

The following were specified by the P.C.I.R.O. as diseases requiring rejection at assembly centre level: (i) communicable diseases, including trachoma; (ii) decompensated heart lesions; (iii) active tuberculosis, whether "open" or "closed", and healed tuberculosis which could not be proved to have been healed for a continuous period of two years; (iv) diabetes; (v) blindness, deafness and dumbness; (vi) pathological tumours; (vii) active venereal disease; (viii) toxic goitre; (ix) mental illness; (x) albuminuria; (xi) glycosuria; (xii) pregnancy in unmarried women.

Despite the former I.R.O. medical examinations, it was found advisable for these candidates to be further checked by selection mission medical officers for the following reasons: (i) Careless or inadequate examination at earlier levels. (ii) Deliberate underwriting of disabilities by the refugee doctors. One could add here that German specialists were sometimes used as consultants by the I.R.O. Their reports were also occasionally biased in favour of the refugees, as they too were interested to see the displaced persons sped on their way to new countries. (iii) Illnesses developing between the I.R.O. and the selection mission medical examinations. (iv) The presentation of many candidates with "doubtful" tuberculous lesions for final consideration by the mission medical officer. Item (iii), in the P.C.I.R.O. list of conditions above concerning tuberculosis, was unenforceable, as no person carried films dating back for this length of time, nor could anyone be reasonably deferred for that period ahead.

Medical Selection for Australia.

In the latter part of 1947, one medical officer sent from Australia was conducting examinations in Germany; soon afterwards short-term (one to three months) medical officers were recruited from London. When I arrived in Germany, in July, 1948, four "selection missions", each comprising two lay immigration officials termed "selection officers", and one doctor were operating in various centres in western Germany. The scheme had developed considerably; a shipping programme outlined in June, 1948, provided for the embarkation of at least 1700 persons per month for the following six months. Obviously, in view of the numbers rejected on medical or security grounds, the actual numbers examined needed to be considerably greater than the numbers embarked. Moreover, the prevailing policy of sending family heads in advance of their families meant that dependent members of large family groups required survey with the family head, as unfitness in any one member would disqualify the entire family. Formerly, husbands had been shipped to Australia in advance of wives or children who were later found to be tuberculous or incurably ill. Finally, delay was increased by the need for re-presentation of many persons previously deferred on medical or other grounds. Thus it became necessary to examine about 80 persons per day in order to fill the available ships. With allowance for interruptions and consultations, this meant about four minutes for each examination, and other unavoidable delays frequently involved work continuing until late into the evening. Examinations were conducted in poorly furnished stone or wooden huts, groups of males and females being taken separately. By the use of the following routine, it was found possible to examine as many as 400 to 500 persons per week, but it was not considered desirable that medical examinations should be conducted at such a rate. (i) Inspection of the body nude. The presence of a tattooed blood group mark on the upper inside aspect of the left arm was noted; it indicated that the bearer had been a member of the German "S.S.". (ii) Manual expression of the penis, by the candidate, for gleet. (iii) A quick routine of exercises (done in groups of eight or ten to save time) which tested the locomotor system and coordination. (iv) Lid eversion, for trachoma. (v) Inspection of the oropharynx. (vi) Auscultation of the heart and chest. (vii) Palpation of gland areas, abdomen and hernial orifices. (viii) Inspection of the chest X-ray film. (ix) Visual acuity in each eye, tested with Snellen's charts by an

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assistant. Sphygmomanometry was found to be time-consuming and inconclusive in these particular circumstances. It became the practice to rely on the blood-pressure readings and the results of urine examinations from the previously conducted I.R.O. medical examinations.

Investigations, including simpler bacteriological and hæmatological procedures, radiography, electrocardiography and basal metabolic rate estimations, were usually available.

In March, 1949, advice was received from Australia that difficulty was being experienced with migrants suffering from conjunctivitis, tinea, varicose veins, bad teeth and other minor ailments, who were using these to avoid unpleasant or arduous employment. It became necessary to defer such persons at resettlement centres for treatment and review.

Tables I and II are compiled from 7000 consecutive personally conducted examinations carried out over the period from November, 1948, to April, 1949, at eight different resettlement centres in Germany and Austria. Rejection rates varied only slightly (minimum 2·4%, maximum 7·1%) from centre to centre. Medical rejection

TABLE I.

Candidates for Migration.	Number.
Migrants medically examined (November, 1948, to April, 1949)	7000
Total medically rejected at initial examination	348 (5%)
Unaccepted relatives and dependants of medical rejectees	317 (4·4%)
Medically deferred	344 (4·9%)
Accepted at initial examination	5991 (85·7%)

of one member of a family unit meant, as has been mentioned previously, that the whole unit, perhaps several persons, became ineligible, and resulted in much wasted medical effort when the other members of the family had been examined beforehand. Such rejections are shown separately in Table I. When the rejected member of the group was an aged parent, much harrowing pleading was forthcoming in the hope that an exception might be made, and very few family groups were prepared to abandon such members and proceed without them. One became strongly impressed by the strength of family ties shown particularly by the agricultural eastern European peoples.

Table II breaks down total rejections into various categories.

Candidates were "medically deferred" for a variety of reasons, including the minor ailments listed above, hernia pending surgical treatment, doubtful tuberculosis, pregnancy, defective vision, anæmia, dental caries and other remediable conditions. Some were eventually rejected, with a slight increase in the "medically rejected" group. No attempt is made to analyse these 344 medically deferred cases further.

Discussion of Reasons for Rejection.

Tuberculosis.

Pulmonary tuberculosis, or "doubtful" chest X-ray findings, accounted for the majority (35%) of rejections in this series, and this was a consistent experience throughout. I am not aware of any surveys covering the incidence of tuberculosis in the refugee population of Germany, although figures of doubtful reliability are available indicating a post-war rise in morbidity for the British zone of Germany as a whole,[7,8] in which rise refugee groups would probably participate. Naturally, few cases of frankly progressive tuberculosis were presented to selection missions, but many calcified, fibrotic and presumably obsolete chest lesions were encountered—end results, probably, of the heavy incidence of infection during the war years. The 122 rejections for pulmonary tuberculosis represent 1·74% of the total persons examined. This is higher than the tuberculosis incidence in mass miniature radiographic surveys in Australia and Great Britain, and is more comparable with the incidence of tuberculous lesions in mass radiographic surveys of detention camp inmates in war-time Germany.[9]

Ideally, any abnormal pulmonary shadow should mean rejection, but the relatively high incidence of these "apparently healed" lesions made this difficult, particularly when rejection of any person, often a dependant, would mean loss of an otherwise acceptable family unit. Attempts to assess activity were not very successful. Sputum examinations invariably gave negative results, and blood sedimentation results were invariably normal. Initially, many persons were deferred for three months for a further chest X-ray examination, but as might be expected, no change was noted. Subsequently, as one became more practised at reading chest X-ray films, a decision was simply made in each case, there and then, on its radiological merits. I tended to accept, on full-sized films, subjects with completely calcified and small discrete clearly fibrotic lesions, rejecting all others.

Reasons for the arrival in Australia of displaced persons with clinical tuberculosis possibly included the following.

TABLE II.

Analysis of the 348 Medical Rejections.

Condition Causing Rejection.	Total.	Percentage of Rejections.	Percentage of Total Examined.
Pulmonary tuberculosis and unsatisfactory chest X-ray findings	122	35·0	1·74
Physical disabilities and orthopædic conditions	66	19·0	0·94
Illiteracy and mental deficiency	42	12·0	0·60
Unsatisfactory physical condition and/or too great age	39	11·1	0·56
Defective vision	38	11·0	0·54
Cardiac disease (rheumatic endocarditis 5, hypertension 3, congenital lesion 2)	10	2·9	0·14
Neurological conditions (post-poliomyelitis 5, hemiplegia 2, Little's disease 1, median nerve palsy 1)	9	2·6	0·13
Trachoma	4	1·2	0·06
Miscellaneous conditions (toxic goitre 2, male sterility 2, gonorrhœa 1, abscess of thigh 1, pregnancy 2, cretinism 1, nephritis 1, abdominal tumour 1, bronchiectasis 1, unrecorded 6)	18	5·2	0·26

1. Medical officers were possibly inexperienced in interpreting miniature films. It should be added here that the technical standard of the miniature films available was at times extremely poor, the reports of the German and displaced person radiologists were occasionally quite unreliable, and no facilities were available for viewing beyond an ordinary magnifying glass. Large films were, as a rule, available, but often were obtained tardily and with difficulty. Experts, working under ideal conditions, do occasionally miss small lesions; and it is to be expected that less experienced and hurried observers, operating under primitive conditions, would be far more likely to do so.

2. There was the problem of applying criteria of acceptability to individual chest X-ray findings—that is, of deciding which types (if any) of "apparently healed" lesions should be regarded as acceptable.

3. Substitution was not uncommon. Persons with known tuberculosis would send friends of similar build for their X-ray examination, as identification checks were not always scrupulous. With the aid of the stethoscope, some of these deceptions were uncovered, but many, I feel sure, were not, and this seems the most likely explanation of displaced persons with extensive tuberculosis being discovered in Australia.

4. Finally, the disease could develop between the time of examination and time of sailing—a period of up to six months or more.

It was imagined that such persons with "healed" lesions as were accepted would be safe, and be highly resistant to further progression of the disease. However, some random

observations seem to show that these apparently healed lesions in migrants can easily break down and be widely disseminated, despite the improved living conditions obtaining in this country. The change of environment, associated often with hard physical labour, and the strain of adaptation to new circumstances, are possible explanations of this apparent breakdown in resistance here.

The whole problem has been discussed at some length in order to illustrate the difficulties of a tuberculosis screening campaign as applied to mass selection of would-be migrants in a foreign country. Early experience taught that the desirable organization for such a campaign would include the following: (i) an efficient over-all X-ray control conducted by Australian radiologists (this was later instituted); (ii) standardized reporting and criteria of acceptability of chest X-ray films; (iii) a rigid system of identification to guard against substitution and impersonation.

Physical Disabilities and Orthopædic Conditions.

The 66 rejections in the category covering physical disabilities and orthopædic conditions consist of the following: ankylosis of various joints, 15 cases; chronic osteomyelitis (some tuberculous), 12 cases; post-traumatic disability of the leg, nine cases; various deformities of the foot, eight cases; severe scoliosis, six cases; amputations, five cases; severely disabled hand, four cases; malunited fracture, three cases; congenital dislocation of the hips, one case; miscellaneous deformities, three cases.

At first, precise standards of physical fitness for selectees were not laid down, except that migrants should be "physically fit and of good physique"; it was understood, however, that disabilities such as those listed above, constituting an employability handicap, should be a cause for rejection, particularly as applicants far exceeded the required numbers. In October, 1948, a directive was issued reminding officers that when they were not entirely satisfied as to the suitability of volunteers, they should reject them.

A further directive was issued in May, 1949, on the subject of physical disabilities. Examples of incapacities which should exclude the subject from selection as a "worker" were "loss of a limb, loss of sight in either eye, or badly dwarfed stature, etc.". Individual disabled dependent members of family groups could be selected, provided the disability "was not such as would render the subject wholly unemployable". Unemployable aged parents in family groups might be selected provided they were "fit for their age and able to look after themselves". Apart from frank orthopædic disabilities, not a few undersized and poorly developed persons were presented, and a rejection category "below physical requirements" became established. Nevertheless, qualities of temperament, character and resourcefulness are often possessed by such individuals, perhaps in compensation for their physical shortcomings, and these often weighed in their favour. Such cases were often assessed after consultation with the lay "selection officers". Some candidates presented as "workers" were found to be over the age limit (forty-five years) for this category, and were rejected as "over age" if their health and physique were not well above average.

Vision.—One-eyed persons, although not necessarily at a disadvantage in many types of employment, were usually rejected, as also were candidates with severe visual defects not well corrected with glasses, which were readily obtainable. This rejection category may seem comparatively large, but inadequate vision was held to constitute a considerable handicap both to employability and to adaptation to new conditions.

Illiteracy and Poor Mentality.—Subnormal mentality and minor degrees of insanity were very difficult to detect, owing to language problems and pressure of time. One man was presented who had been on several occasions an inmate of a mental institution. Many borderline cases were considered in conjunction with selection officers. Frank illiterates were discarded.

Other Conditions.—The remaining rejection categories comprise general medical and miscellaneous conditions, overlooked or not considered significant by the I.R.O. doctors.

Assessment of Fitness.—No further analysis of the 5% of medical rejections can be attempted. These figures naturally throw no light on health standards of displaced persons, as the entire group was subject to prior medical examinations, and the obviously unfit had been excluded. The point of interest is that of 7000 persons considered "fit" at two preceding examinations, 348 (5%) were initially rejected, and 344 were deferred, and of the latter a further number would be subsequently rejected. When allowance is made for P.C.I.R.O. doctors giving "borderline" subjects the benefit of any doubt, and for the few disabilities that had been previously overlooked, it is evident that ideas on what constitutes "fitness" must differ, and as has been indicated this applies particularly to the acceptability of the chest X-ray film. The assessment of "fitness" is a subject scarcely considered in the undergraduate curriculum, yet it is highly important in many spheres of medical activity. Neither army nor life assurance fitness standards seemed applicable to refugees of widely differing age groups who, having survived the war and lived in crowded camps on bare subsistence food rations, would be proceeding to an infinite variety of occupations in their new country.

Criteria of fitness eventually adopted were based on freedom from infectious or contagious disease, and on absence of any conditions which might prejudice either future good health or employability in the general labour market. Such assessment was compatible with the limited time available, fulfilled the medical requirements for immigration to Australia, and provided persons fit to support themselves in the country of their adoption. Admittedly, some substandard individuals were probably accepted, and although the primary objective was the recruiting of suitable migrants, a substantial contribution to the solution of the European resettlement problem could reasonably be said to have been made. Finally, the knowledge of how much it meant to these unfortunate victims of circumstance to leave behind them a miserable and aimless existence might have sometimes influenced medical decisions in their favour.

Summary.

1. The circumstances leading up to the resettlement schemes for displaced persons are outlined.

2. The medical selection of migrants for Australia is described.

3. Over a specified period of five months 7000 medically pre-selected persons were examined, out of whom 348 were medically rejected and 344 were medically deferred.

4. Reasons for rejection are reviewed, chief of which were "tuberculosis and unsatisfactory chest X-ray" and "physical disabilities and orthopædic conditions".

5. Difficulties in a tuberculosis screening campaign are discussed.

6. Comment is made on standards and on assessment of fitness.

Acknowledgement.

I am indebted to the Director-General of Health, Commonwealth of Australia, for permission to publish this paper.

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SOME OBSERVATIONS ON THE USE OF "BREVIDIL E", A NEW MUSCULAR RELAXANT, IN ELECTRO-CONVULSIVE THERAPY AND A COMPARISON WITH "SCOLINE".

By VAL T. STEPHEN,
Melbourne.

THROUGH the courtesy of the firm of May and Baker (Australia), Proprietary, Limited, I have been able to undertake some clinical tests in the use of "Brevidil E" (M-B 2210) or bis (β di-methyl aminoethyl bis-ethiodide) succinate as it now is known. It is a white crystalline powder which is readily soluble in water. It is also partly soluble in certain organic solvents—alcohol, acetone, ether, benzene and chloroform. It melts at 198° C. and a 2% weight for volume aqueous solution is clear and colourless with a pH of 6·6. The molecular weight is 572.

I have used the drug in a series of cases of electro-convulsive therapy, comparing the effect with succinyl choline chloride ("Scoline") in the same patients.

Technique.

Both drugs were used on different occasions for electro-convulsive therapy in the same patients. In all cases the patients were anæsthetized with sodium thiopentone, 0·2 to 0·3 gramme. In half the series, "Brevidil E" was given with a separate syringe immediately after the sodium thiopentone. In the other half the two drugs were mixed immediately before injection and given combined. As with succinyl choline chloride, a transient precipitate formed and redissolved in excess thiopentone sodium solution.

With succinyl choline chloride, over a series of 1500 anæsthetics the mixing of the two drugs caused in about 5% of cases a recollection of the muscular twitching and inability to "get one's breath" just before consciousness was lost; in other words, the "Scoline" acts a moment before the sodium thiopentone.

With "Brevidil E" the onset of muscular fibrillation was about three to five seconds longer in onset, and in the series tested no patient had any memory of unpleasant sensation before losing consciousness. The number tested (10) with the drugs combined is too small as yet to give a definite answer about this.

Duration of Action.

With "Brevidil E", in 17 of the 20 cases respiration returned slightly more rapidly with equivalent degree of relaxation, the period averaging two to two and a half minutes compared with two and a half to three minutes with "Scoline". In three cases the period of relaxation was greater by about one to one and a half minutes.

Degree of Relaxation.

I have tried to obtain the same degree of relaxation with the two drugs in the same patients. With equivalent relaxation for the clonic phase of the convulsion, the initial tonic jerk is slightly greater in force.

The Dosage.

With succinyl choline chloride, the dosage is estimated by the "rule of thumb" method of placing a decimal point before the weight to the nearest stone and using this as a fraction of a millilitre. For example, a man weighing nine stone needs 0·9 millilitre of "Scoline"—that is, 45 milligrammes, which is about five milligrammes per stone.

"Brevidil E" requires a 75% increase in dosage compared with "Scoline".

Pharmacology.

The formulæ of the two relaxants are as follows:

"Brevidil E": $CH_2–COOCH_2–CH_2–N–(CH_3)_2–C_2H_5–I$
$CH_2–COOCH_2–CH_2–N–(CH_3)_2–C_2H_5–I$

"Scoline": $CH_2–COOCH_2–CH_2N–(CH_3)_2–cl$
$CH_2–COOCH_2–CH_2N(CH_3)_2–cl$

"Brevidil E" and "Scoline" both cause neuromuscular blocking by excessive depolarization at the region of the motor end-plate, and both are rapidly destroyed by the esterases of the body. The muscular twitching is produced by the depolarization, the prolongation of which state prevents further impulses passing on to the muscle fibre from the motor end-plate until the esterases of the body destroy the drug.

Antidote.

In practice, owing to the ultra-rapid effect of these drugs, no antidote is necessary—indeed, "Prostigmin" actually prolongs the action. Curare itself is actually an antagonist to these substances.

Side Effects.

There are virtually no side effects. Blood pressure readings were taken before and after injection of the "Brevidil E". In all cases there was a drop of 20 to 30 millimetres of mercury in the systolic blood pressure, owing partly to the barbiturate and partly to the flaccidity of the muscles. This is also the case with "Scoline". Throughout the entire series of 1500 cases with "Scoline" and 20 cases with "Brevidil E", no allergic phenomena have been noticed.

Summary.

The effects of "Brevidil E" and "Scoline" in electro-convulsive therapy are compared.

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My thanks to May and Baker (Australia), Proprietary, Limited, for information and samples of "Brevidil E", and to Allen and Hanbury for information and samples of "Scoline".

Reports of Cases.

BILATERAL CONGENITAL ANTERIOR STAPHYLOMA TREATED BY KERATOPLASTY.

By H. C. BECKETT,
Sydney.

In congenital Anterior Staphyloma a child is born with an opaque cornea which bulges prominently through the lids, exhibiting a slight bluish tinge owing to the fact that its posterior surface is lined by the uveal pigment of an incarcerated iris shining through its thinner portions. The eye is obviously useless as a visual organ; and although it may be retained for some time, the bulging surface frequently ulcerates and may perforate, necessitating excision of the eye.

THE foregoing description by Duke-Elder (1938) indicates how remote is a patient's chance of ever attaining useful vision in an eye so affected.

There are two types of staphyloma: (*a*) inflammatory, (*b*) developmental. Sonnenmayer (1840) put forward the theory that intrauterine inflammation was the cause of the inflammatory type. With regard to the developmental type, there is much evidence to suggest a simple aberration as the causative factor. Peters (1906) holds that there is malformation of the lens vesicle from the surface epithelium. Collins (1907), however, is just as emphatic that the mesoderm between the lens vesicle and surface epiblast is non-differentiated and that this causes the aberration.

Twenty-six cases have been reported in the literature, the present case making the total 27.

In the cornea, irregular cellular tissue replaces the regular lamellæ. Bowman's and Descemet's membranes are usually partially or totally absent, or present only in the

periphery. In most cases dense scar tissue represents the pseudo-cornea.

The iris stroma is atrophied, but the pigment epithelium persists; the membrane is adherent to the cornea over a part or the whole of its surface.

The lens may be normal, cataractous or shrunken; it may be extruded or stuck to the cornea.

The ciliary body may be more or less normal or attenuated.

The posterior segment may be normal, or the retina may be partially or wholly detached.

The condition is usually bilateral, or the second eye, if not staphylomatous, may exhibit other abnormalities, such as scarring of the cornea, microphthalmos or *phthisis bulbi*.

Clinical Record.

D.K., a quarter-caste aboriginal, aged six years, was first examined on November 1, 1950, with a history of having been blind since birth.

On examination of the child, both eyes were kept firmly closed and his head was flexed as far as possible, in an effort to exclude light from the eyes. When the upper eyelid of each eye was retracted a staphyloma protruded about one inch through the palpebral fissure. The right eye was at a more advanced stage than the left eye, and the tension to digital palpation was higher in the right eye.

Any examination of the eyes was difficult, owing to the extreme photophobia, but "Decicain" drops (0·75%) were helpful. The visual acuity in both eyes was limited to distinguishing light from dark; projection was accurate.

The Wassermann test failed to produce a reaction.

Antibiotic therapy was instituted and the boy was admitted to hospital.

On January 3, 1951, the right cornea appeared to be on the point of perforation, and in a few days this occurred. It was treated by the application of a light pressure bandage. On February 2 both corneæ ruptured. A light pressure bandage was applied to both eyes whilst the case was reviewed.

On March 2 a cyclodialysis was performed on the right eye. The sclera was much thinner than normal. The perforation in the pseudo-cornea became sealed, and no further leak of aqueous occurred from this eye.

On March 16 a 10-millimetre circular trephine was used to remove most of the staphyloma of the right eye. The central guard of the trephine was retracted as high as possible and the staphylomatous tissue was coaxed up the hollow middle of the instrument, care being taken, however, not to remove the entire pseudo-cornea, but to make the circular incision one or two millimetres from the limbus. The lens was shrunken and adherent to the posterior surface of the cornea.

A 10-millimetre healthy graft from a cadaver cornea replaced the pseudo-cornea, by means of 30 direct sutures of number seven 0 braided silk.[1]

The operation was performed under "Pentothal" anæsthesia. The only anxious moments were experienced when the trephine, with guard set at two millimetres, was first applied to the bulging staphyloma, and it was obvious that it was far too small.

The stitches were removed in twenty-one days and a pressure bandage was used for eight weeks from date of operation. The graft "took", but after three weeks it started to become opaque, until the cornea had a uniform light opalescent appearance, which has remained stationary up to the present.

On March 30, 1951, a cyclodialysis was performed on the left eye, which sealed the perforation. The sclera was again found to be thinner than normal, but thicker than that of the right eye.

On December 22 most of the pseudo-cornea was removed from the left eye and replaced by a 10-millimetre healthy graft from a cadaver eye. The lens was shrunken and cataractous, and in its normal position. Unfortunately no attempt was made to extract it at the time.

Convalescence was uneventful and the patient was discharged in three weeks to a home for blind and partially-sighted boys. Dark, fully covered goggles were ordered to be worn constantly. On December 22 the right eye with a −4 dioptre lens could see hand movements at four feet; projection was accurate. The left eye could distinguish light from dark, and projection was accurate. Searching, nystagmoid movements were present in each eye. The left globe was softer than the right one.

Comment.

The *papier mâché* appearance of the sclera and the disorganized cornea suggest keratoscleritis, with necrosis of the collagen tissue of the globe (Swan, 1951), and this could account for the condition without the invoking of an ectodermal or mesodermal aberration as the causative factor.

In a review of the case whilst a decision was being made on treatment, it was noted that the posterior segment was more or less normal; aqueous was being formed by the ciliary body and it was escaping from the globe. Some absorption must have been occurring in the region of the angle of the iris, otherwise the globe would have been much more distended (the boy was six and a half years old), or *phthisis bulbi* would have set in. The other explanation for aqueous escape would be intermittent rupture of the pseudo-cornea. In this case infection would be almost impossible to avoid, as the boy had lived since birth in Darwin, a tropical town in northern Australia.

The softness of the sclera allowed stretching of the globe, and this had apparently saved the optic nerve from being killed by any glaucomatous pressure that occurred. However, the posterior segment of the globe was not much larger than normal for a boy of his age.

As some absorption was occurring from the region of Schlemm's canal, care was taken to leave the angle of the iris untouched when the pseudo-cornea was excised.

Cyclodialysis achieved the double purpose of sealing the perforation in the staphylomatous cornea and opening a permanent new channel for aqueous absorption.

The excision of the bulging cornea could be carried out with scissors just as satisfactorily as with a circular trephine, but direct suturing of the graft is essential.

The poorer visual result from operation in the left eye is probably explained by the presence of a cataractous lens. The soft left globe may mean that *phthisis bulbi* is developing or else that more absorption of aqueous is occurring from the region of Schlemm's canal than in the right eye; the extra drainage into the suprachoroidal space provided by the cyclodialysis could then cause the hypotension.

Should hypertension occur in the right eye in the future, goniopuncture, cyclodialysis and/or cyclodiathermy can be employed to control it.

The boy is being educated in a school for blind and partially-sighted children, and is already proficient at braille. Has the small gain in vision in the right eye been worth achieving, or would it have been better to enucleate both eyes at the outset? At the time it seemed worth while to try to save the eyes, because perception of light with accurate projection was present. The teaching staff and the matron at the boys' school are emphatic that it is a great help to a person to have even a small amount of vision, such as D.K. possesses. He can distinguish moving vehicles at a distance of 30 feet and tell their colour. Qualitatively his gain in vision is much greater; the boy takes a keen delight in colours and can tell the colour of a rose held in his hand, or a large object, such as a shrub, at 30 feet.

Summary.

1. Congenital anterior staphyloma is reviewed, with its reported occurrence and pathology.

2. A new case is described.

[1] Kindly supplied by Davis and Geck, Inc., New York.

3. A necrosis of the collagenous tissue of the globe is suggested as the cause of the condition.

4. The present patient was treated by preliminary cyclodialysis followed by keratoplasty, which resulted in a quantitative gain in vision to hand movements at four feet in an eye which previously had perception of light only, and a much greater qualitative gain.

5. This added vision is a help to the boy in class and games, and an appreciation of colours has brightened his life.

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NEUROBLASTOMA OF THE NASO-PHARYNX.

By G. K. VINCENT,
Sydney.

D.C., a male child, aged six years, presented in February, 1952, with a history of recurrent colds, sore throats, and recurrent troublesome nasal discharge. On examination he was found to have enlarged infected tonsils, some mucopus lying in his nasal cavities, and chronic inflammatory enlargement of his anterior and posterior cervical lymph glands.

On March 18 operation for removal of his tonsils and adenoids was performed, and at the same time his maxillary antra were washed out. The antral lavage fluid was clear, but it was observed that his adenoids were very large, soft and friable and hung like thick villi from the vault of the naso-pharynx. However, no significance was attached to this, except that it was thought to be an exaggerated response to recurrent infection. No specimen was saved for biopsy. His post-operative progress was uneventful, but on April 1 he developed a relatively painless right "parotid" swelling, which gradually increased over several days. The child seemed well, and his nose and pharynx looked healthy. He was thought to have mumps, which was epidemic at the time. One week later his "parotid" swelling was unilateral still, and unchanged, and he commenced to develop nasal discharge and difficulty in speaking.

On April 15 his parents again sought medical advice because of the above-mentioned symptoms. On examination, he had pronounced swelling in the right parotid area, and the right side of his palate was being pushed downwards and medially by a large, hard swelling arising in his naso-pharynx. He was afebrile.

A tentative diagnosis of retropharyngeal abscess was made, and he was admitted to hospital forthwith. A full blood count gave results within normal limits, and X-ray examination of the cervical part of his spine revealed the following abnormalities: "There is some increased thickness of the soft tissues anterior to CV1 and the upper part of CV2. The air space at the back of the nose and mouth is seen to be encroached upon. There is an ill-defined shadow just anterior to the dens. Its significance or accurate localisation cannot be determined. There is no bony abnormality seen." He was given massive dosage of calcium penicillin, and observed.

On April 18, under general anæsthesia, an attempt was made to drain the "abscess" endorally. An incision was made into the mass in its most prominent part, and it was found to consist of dense fibrous-like tissue, which was not very vascular. Eventually, in the depths of the mass in the region of the basi-sphenoid, a small amount of thin serous fluid was evacuated. Unfortunately, no specimen was preserved.

The pharyngeal swelling continued to increase after this, and the possibility of tracheotomy was prepared for. On April 29 an attempt was made to aspirate the parotid swelling from outside, but no result was obtained. During this time serial blood counts gave results within normal limits, and further X-ray examination of the cervical part of the spine revealed no necrosis of bone.

By this time it was apparent that the condition could not have been inflammatory and must have been neoplastic. On April 30 he was transferred to Royal Prince Alfred Hospital, with the object of the exhibition of deep X-ray therapy. At this stage he had pronounced respiratory obstruction and was unable to articulate, and his tongue was more or less fixed. He had deafness in his right ear, and exhibited Horner's syndrome on the right side.

On April 31 emergency tracheotomy was performed. On May 3 punch biopsy was attempted, but the pathologist was unable to give any opinion because of the minute amount of tissue available. On May 9 the Mantoux test produced a negative result. On May 2 deep X-ray therapy was commenced. At first this appeared to reduce the size of the parotid and pharyngeal swellings, but then it was obviously having no effect and was finally suspended on June 7.

During this time his general condition was deteriorating, he was becoming increasingly cachectic, and his tongue had become greatly protruded and fixed.

On June 28 he coughed some blood, and on July 3 he had a hæmatemesis and died.

A post-mortem examination made fourteen hours after death gave the following results. The body was that of an emaciated child of about the stated age. There was a tracheotomy opening in the neck. *Rigor mortis* was present. The tongue was protruded from the mouth and was greatly swollen and ulcerated superficially. There was a large tumour mass, which extended from the lower margin of the thyroid cartilage surrounding it and was limited by the vertebral column posteriorly. It extended upwards, involving all of the salivary glands, and in the mouth it crossed along the base of the tongue, almost completely occluding the hypopharynx. It filled up the posterior half of the mouth cavity involving the mouth cavity and extended upwards to the base of the skull. It also invaded the right orbit. It penetrated the skull at several places, presenting underneath the dura (that is, being extradural) in the middle fossa on the right side and penetrating the basi-sphenoid. This tumour was white and fleshy. The thyroid gland could not be found in the tumour mass.

The trachea and larynx were normal, although the epiglottis was pushed backwards and the tumour practically covered it. Below the tracheotomy, however, the trachea was inflamed and slightly hæmorrhagic.

Neither pleural cavity contained any excess of fluid.

The right lung weighed 170 grammes and the left lung 80 grammes. The left lung was normal. In the right lung, however, in the posterior portions of the upper and middle lobes, early bronchopneumonia was present.

The pericardial cavity appeared normal.

The heart, which weighed 65 grammes, appeared normal.

The peritoneal cavity did not contain any excess fluid.

The spleen was normal.

The liver, which weighed 635 grammes, was normal. The gall-bladder and bile ducts were normal.

The right kidney weighed 75 grammes, the left kidney 70 grammes. There were a number of secondary tumours in each kidney. These were up to 3·0 centimetres in diameter and were fairly sharply circumscribed.

In the alimentary tract a tumour was present in the anterior wall in the body of the stomach under the mucosa which measured 3·5 centimetres in diameter. The mucosa over it was ulcerated, and hæmorrhage had taken place, so that the stomach contained 58 ounces of blood clot which had been partly altered by digestion. Altered blood was found in the remainder of the alimentary tract, but there was no gross lesion.

The pancreas was infiltrated by tumour, although the lobulations could be discerned in places. Tumours were also present in the adjacent lymph nodes.

There was a spherical tumour mass in the left suprarenal measuring 2·5 centimetres in diameter, and surrounding the right suprarenal there was a small tumour.

The bladder and genitalia were normal.

The brain, which weighed 1255 grammes, was normal.

Microscopic examination of sections from various portions of the tumour mass showed that the lesion was a neuroblastoma. It probably commenced in the neck in the cervical sympathetic tissues.

Reviews.

Elementary Hygiene for Nurses: A Handbook for Nurses and Others. By H. C. Rutherford Darling, M.D., M.S. (London), F.R.C.S. (England), F.R.F.P.S. (Glasgow), and John Denis Murphy, M.B., B.S. (Sydney); Tenth Edition; 1952. London: J. and A. Churchill, Limited. 7½″ × 5″, pp. 302, with 72 illustrations.

IT is thirty-five years since the first edition of "Elementary Hygiene for Nurses" by H. C. R. Darling appeared, and now in compiling the tenth edition, the author has been aided by J. D. Murphy. There are not many text-books which retain their popularity like this one has—a fact that in itself vouches more than adequately for its intrinsic value, and the clear and thorough manner with which the author deals with his subject reflects a careful and scientific outlook. The book is divided into eleven chapters, comprised of the following headings: "Ventilation and Heating", "Dust, Light", "Food and Milk", "Dietetic Treatment of Diabetes, Epilepsy and Obesity", "Water, Sanitation of Buildings, and Drainage", "Sewage, Sanitary Inspection of Dwellings and Temporary Hospitals", "Prevention of Infectious Diseases", "Immunity Against Infectious Disease: Parasites and Insects", "Noxious Insects", "Personal Hygiene", "Health Nursing"—and ends with an appendix giving such information as the composition of poisons for pests, lists of the infectious diseases and their periods of infectivity and tables of weights and measures. Each topic is discussed in a concise dogmatic fashion, which makes the book invaluable as an aid to examinations, and all nurses can use this work, confident that when they have read and understood it they know all they need about hygiene and its practical applications.

Pictorial Handbook of Fracture Treatment. By Edward L. Compere, M.D., F.A.C.S., and Sam W. Banks, M.D., F.A.C.S., revised with the assistance of Clinton L. Compere, M.D., F.A.C.S.; Third Edition; 1952. Chicago: The Year Book Publishers, Incorporated. 8½″ × 6″, pp. 424, with 223 illustrations. Price: $6.50.

IN the review of the previous edition of this book it was pointed out that small handbooks on fractures were rarely as useful as large ones, inasmuch as a doctor consulted such a book mainly when he was in difficulties, and on those occasions he wanted all the detail he could get. Nevertheless, it was considered that in this particular text-book the authors had very well got over the disadvantages of a small book by the skilful use of pictures. This opinion is still held. The book is a good one.

In the preface the authors state that they have included in this edition the improvements in technique that have been made since the previous edition appeared. That they are abreast of the times is certain. This is mainly shown by the number of pictures which demonstrate the use of plates, screws and bolts. The surgery of fractures is at present in a phase when such pieces of apparatus are being tried on a wide scale. Whether the 1963 edition of this book will display such pictures remains to be seen.

Help Yourself Get Well: A Guide for TB Patients and their Families. By Marjorie McDonald Pyle, M.D., with a foreword by H. Corwin Hinshaw, M.D.; 1952. London: William Heinemann (Medical Books), Limited. 7½″ × 5″, pp. 158. Price: 12s. 6d.

THE subtitle of "Help Yourself Get Well", by Marjorie McDonald Pyle, is "a Guide for TB patients and their Families", to which might be added "and their Doctors". For this book should be in every practitioner's library, or better there should be one copy for his own reading and a second one to lend to patients, their relatives and friends. The author, herself having suffered from the malady, can view her topic subjectively, and she has written a book of great value to all sufferers, doctors and occupational therapists. The outlines of all aspects of the long period of treatment, which every victim of tuberculosis must face, are given, and patients are told how to counteract the disappointments that their illness entails. Details are given for planning the day while the patient is having bed rest, and he is told how best to adapt his day to his own special needs, with guidance on such things as reading, writing, music and other hobbies as well as all phases of rehabilitation. Chapters are devoted also to the psychology of the tuberculous and to famous victims of past and present times. Any intelligent patient who reads this book will be able to cope better with the self-discipline that he must impose, and yet it will help him to make the days of enforced idleness so full that he, in the words of the song, will be "busy doing nothing", until that time when he can busy himself in active life again.

Synopsis of Obstetrics. By Jennings C. Litzenberg, B.Sc., M.D., F.A.C.S.; Fourth Edition; 1952. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 8″ × 5½″, pp. 378, with 157 illustrations, five in colour. Price: £2 17s. 9d.

THE fourth edition of Litzenberg's book brings it up to date in many major sections. In the revision McLennan has rewritten the chapters on Rh iso-immunization, pregnancy toxæmia and Röntgen pelvimetry, and one cannot but agree that he has endeavoured as stated in his preface to express the most modern concepts of obstetrical practice.

The volume commences with chapters on ovulation and fertilization, implantation, and endocrine function in pregnancy, and proceeds after a brief but comprehensive survey of the physiology of pregnancy to the diagnosis and management of normal pregnancy, including excellent remarks on antenatal care. The management is discussed in considerable detail, while abnormal mechanisms are considered somewhat briefly. Later sections deal with medical complications of pregnancy, the pathology of labour and the puerperium, dystocia due to contracted pelvis, ante-partum and post-partum hæmorrhage, and the volume concludes with a short section on obstetric surgery.

The only major points for criticism concern the management of ante-partum hæmorrhage due to *placenta prævia*, and of post-partum hæmorrhage. In the former the author favours emptying the uterus by the most conservative method as soon as the condition is diagnosed. As indicated in the review of the previous edition, this implied condemnation of expectant treatment and the reluctance to use Cæsarean section do not seem to be supported by recent papers on this difficult subject. In the management of post-partum hæmorrhage the intravenous use of ergometrine is not mentioned, though its use as a prophylactic measure against excessive blood loss is indicated earlier in the book.

A great deal of work has been done to provide an adequate though brief survey of the field of obstetrics, and the resulting volume is easy to read and well set up, and should be of great value as a convenient reference in most obstetric problems.

The Scientific Study of Personality. By H. J. Eysenck, Ph.D.; 1952. London: Routledge and Kegan Paul, Limited. Sydney: Walter Standish and Sons. 8½″ × 6″, pp. 334, with 30 illustrations. Price: 30s.

DR. H. J. EYSENCK gives an account of developments since his work "Dimensions of Personality" was published five years ago. His aim is to define the structure of personality by means of experimental quantitative procedures, using objective behaviour tests in preference to *questionnaires* and projective methods, on the principle that what the patient does is a more reliable index of his personality type than what he thinks. Many of Eysenck's tests involve motor and autonomic reactions, but use is also made of verbal tests such as the Maudsley medical *questionnaire* and a verbal connexion test. Dr. Eysenck is of opinion that a battery of objective behaviour tests proved superior in reliability and validity to the personal interview in the assessment of qualifications for positions and careers. The book will appeal particularly to research psychologists, but the clinician will find the chapters on heredity and environment, on neurotic and psychotic dimensions, and on the organization of personality of special interest. Dr. Eysenck's researches have led him to the conclusion that neuroticism and

psychoticism, far from differing from normality merely in degree, have each their own continua linking normality with neurosis or psychosis as the case may be. In other words neurosis and psychosis differ qualitatively rather than quantitatively. The researches in progress in the psychological department of the Maudsley Institute of Psychiatry are breaking new ground, but how far they will offer a threat to time-honoured methods of clinical investigation remains to be seen. Already the two schools are rivalling each other in assessing the results of leucotomy.

Fœtal and Neonatal Pathology. By J. Edgar Morison, M.D., B.Sc.; 1952. London: Butterworth and Company (Publishers), Limited. Sydney: Butterworth and Company (Australia), Limited. 10" x 7", pp. 378, with 59 illustrations. Price: 68s. 6d.

J. EDGAR MORISON, of Belfast, states that his work is an attempt to provide a basis for the study of disease in the fœtus and newborn infant and he has gone far in this aim.

The subject matter is divided arbitrarily into three parts. In the first section dealing with disturbances arising during intrauterine life, the author discusses environment and heredity, the fœtal circulation, nutrition and growth, prematurity and post-prematurity, congenital abnormalities, stillbirth, multiple birth and congenital tumours. In the second portion of the book, disturbances due to failure of the fœtus to adapt his vital functions to the new conditions of extrauterine life are discussed. Post-natal metabolism, respiration, digestion and excretion are dealt with in this section. In the third division of the book, infection in fœtal and neo-natal life is the subject reviewed.

The author has based his discussion on a series of 530 autopsies of stillborn infants and 802 infants who died in the first month of life in two hospitals in Belfast. At the same time he undertakes a critical appraisement of a great deal of literature and attempts to distinguish between what is relatively well established and what is in need of further investigation. At the end of each chapter there is a useful list of references.

Although the general approach to the subject is a theoretical one, clinicians and pathologists interested in this field will find much of value.

Some statements in the text are difficult to follow, because of poor construction of sentences, for example: "Prematurity and stillbirth are comparable to many symptoms, such as jaundice, noted in clinical medicine. Neither is a simple pathological entity, since the only proper basis for this is a common etiology." Referring to intranatal or intrapartum stillbirth, the author states: "These occur during labour and usually while the fœtus is traversing the birth canal. This is the most perilous period of intra-uterine or extra-uterine existence." On page 220 we find this statement: "In man it is probable that normally the thyroid is active in the fœtus, but that maternal thyroid secretion can reach the fœtus." Statements like these puzzle the reader and need further clarification. On page 155 there is an incomplete statement: "Death is very rarely recorded in the neo-natal period"—due to what? On page 206 he writes of morphological "form".

Apart from such blemishes, the book is most acceptable and valuable, and fulfils a definite need. It is illustrated by 59 photomicrographs, drawings and tables. There is still a great deal of research required to bridge the gaps in our knowledge of fœtal and neo-natal pathology. This is stressed by the author of this book who states that even after careful consideration of the clinical and post-mortem findings, a large number of cases remain in which no pathological basis for fœtal death can be recognized.

The Oculorotary Muscles. By Richard G. Scobee, B.A., M.D., F.A.C.S.; Second Edition; 1952. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 10" x 6½", pp. 512, with 159 illustrations. Price: £5 15s. 6d.

ALL too frequently a review of a book and an appreciation of its recently deceased author can be combined in one. The second edition of Richard Scobee's "Oculorotary Muscles" is as welcome as the news of his death is lamented. No more eloquent testimony to his writings can be found than that shown in his life story. He succumbed, fourteen months after his first coronary occlusion, when at the age of thirty-eight years he was relaxing over his stamp collection. It is difficult to believe that he had but ten years of professional life, for in this time, so wrote an associate in America, "he revolutionized the teaching and practice of strabismus correction. . . . His great achievement was removing the mystery from squint and in teaching other physicians how to follow his methods". He put himself through college, and after three years of military service became assistant ophthalmologist at the Washington University, in charge of post-graduate teaching. At the School of Aviation Medicine at Randolph Field he introduced hundreds of military physicians to ophthalmology, and was voted the best teacher in the school.

This edition of his text-book contains the best material from his own bibliography of 70 items. In each chapter there is a clearly written well-balanced summary of knowledge and of modern theories. In the sections on anatomy his own chief contribution deals with the various anomalies of ligament and fascia that appear to underlie some forms of heterotropia. The chapters on the origin, recognition and treatment of heterophoria bear witness to the work he did when studying aviation and pilot efficiency, and later when analysing 2300 cases. Here some facts are recorded for the first time. Nowhere in the literature is there a simpler explanation of the mysterious alternating hyperphoria. "The nature of the phenomenon gives a clue to its proper terminology—alternating sursumduction." The author's description of the handling of esophoric patients is masterly and displays his sound knowledge of human nature. Some authorities will find his approach to divergence over-simplified. "If one believes that divergence is merely passive, then convergence excess and insufficiency are all that need be named." Others, possibly influenced by an occasional finding of "divergence paralysis", postulate a positive function and a centre near the abducent nucleus. The sections dealing with "Taking the History" and "Making the Diagnosis" are most refreshing. The author does not give all of the exact details of surgical technique for the multitude of operations that may be performed. "Every ophthalmologist who has insomnia has devised a new operation for convergent strabismus." "This remark was made in 1919. There have been many wakeful nights since." However, there is an unusually clear description, very well illustrated, of all the operations one is likely to perform. The lessons learned by a close observer are detailed in a valuable few pages on post-operative care. "The final chapter will be of little interest to the ophthalmic surgeon who consistently gets good results in his tropia surgery. It should be of some interest to those whose results are not always what we hope they might be." So wrote the author, and one of his colleagues wrote: "He was completely intellectually honest. . . . Perhaps his most indicative professional characteristic was his willingness to change his mind when new information showed that his former ideas were incomplete or wrong."

Scobee wrote in his first preface that he had been a convert of Chavasse for several years. It was Chavasse who in his own preface wrote: "There is magic in the name of Helmholtz, Hering, Tschermak, Javal and Worth." Perhaps it is not a vain hope that the latest to sup with them at their feast of knowledge is that brilliant young man, Richard Gordon Scobee—"who was so full of life and fun".

The Rotunda Text-Book of Midwifery for Nurses. Edited by O'Donel Browne, M.B., M.A.O., M.A., Litt.D., F.R.C.P.I., F.R.C.O.G.; 1952. Bristol: John Wright and Sons, Limited. 7½" x 5", pp. 308, with 135 text figures. Price: 21s.

IT is perhaps typical of the late O'Donel Browne that, in spite of his many teaching, professional and administrative commitments as Master of the Rotunda Hospital, he should find time to publish a text-book of midwifery for nurses because he felt that there was a need for the Rotunda teaching and practice in this sphere to be placed more firmly on record. It is pleasing therefore that this, the first edition, should be accompanied by a publisher's note expressing the hope that this little volume and subsequent editions "will become a memorial to the late Master, who served the hospital so well".

To those concerned with these matters there might appear already to be a redundancy of nurses' text-books of midwifery, but should it ever become a matter of the "survival of the fittest", there is little doubt that O'Donel Browne's book will survive if only because of its simplicity and clarity of style, and because it seeks constantly to remind the student midwife of her duties under a variety of circumstances if and when she chooses to practise midwifery independently.

There is a strong Dublin flavour about some of the teaching; thus in regard to the management of the third stage of labour: "We advocate the 'hands off' treatment in

the third stage unless there is some complication needing investigation." The routine administration of ergometrine before the completion of the third stage of labour has apparently not found sufficient favour at the Rotunda to justify its recommendation to trainee nurses. It is advised, however, "should there be any tendency to post-partum hæmorrhage".

Early rising in the puerperium receives no advocacy from O'Donel Browne, and in reference to institutional practice the vexed question of segregating babies in nurseries, as against "rooming in" is, perhaps wisely, ignored.

The management of puerperal infections is well described and illustrated. On the other hand, in regard to prolongation of labour, one would like to see a clearer distinction made, even in a nurse's text-book, between hypertonic and hypotonic primary uterine inertia. The clinical picture can be so contrasting and the management (including the nursing) so different in many important respects that it is no longer possible to discuss primary uterine inertia under a single heading.

The resuscitation of the newborn is wisely described in detail along generally acceptable lines.

There are separate sections on the various types of complicated labour; one wonders whether the time has not come to teach nurses something of the Lovset technique for the delivery of extended arms in a breech presentation.

The complication of impacted or apparently impacted shoulders, after an uneventful delivery of the fœtal head, is something that an obstetric nurse practising independently may suddenly find herself confronted with; its management is well described.

Nurses are rightly warned of the dangers inherent in carrying out a vaginal examination in cases of suspected *placenta prævia*, and suggestions for the management of this condition follow recent teaching and practice.

O'Donel Browne's recent interest in the treatment of eclampsia is naturally reflected in the section dealing with this condition. The importance of good nursing in these cases is, however, not overlooked and the chapter concludes with the following sound advice: "No matter what treatment the doctor orders it is likely to fail unless the nursing duties are carried out skilfully and with the utmost attention to what may appear to be unnecessary detail."

The book concludes with a series of short but helpful chapters on such subjects as the Rh factor, radiology in obstetrics, induction of labour and advice and instructions to nurses proposing to practise obstetrics independently.

Bedside Diagnosis. By Charles Seward, M.D., F.R.C.P. (Edin.), with a foreword by Henry Cohen, M.D., F.R.C.P.; Second Edition; 1952. Edinburgh and London: E. and S. Livingstone, Limited. 7¼" × 5", pp. 396. Price: 17s. 6d.

EVERY practising physician, surgeon and final year medical student should have a copy of the second edition of "Bedside Diagnosis" by Charles Seward constantly by his side, for it will aid greatly, as the title states at the bedside, in the diagnosis of many knotty cases, and also will enable the student more readily to give the examiner the most logical replies in both written and oral examinations. Chapters are devoted to one major symptom each, and all aspects of this symptom are dealt with fully. Thus, twenty pages are devoted to discuss both jaundice and dyspnœa, whilst ninety-nine pages are given to that major symptom—pain, which is divided off into headings for each anatomical origin of the pain, as well as covering pain of psychic and psychosomatic origins.

For tutors there are ready-made lecturettes in each chapter, and whether the topic should be the rather complex one of dysphagia or the more common one of "pain in the side"—all the details required to present the subject in a clear-cut manner are set out in an easily read and assimilable fashion. In these days when the vogue is for more and more complicated biochemical and pathological investigation, it is refreshing to be reminded that we each have five senses (and sometimes six) to use, as aids in quickly assessing and diagnosing on the spot at the patient's bedside.

Regeneration and Wound-Healing. By A. E. Needham, M.A., B.Sc.; 1952. London: Methuen and Company, Limited. 7" × 4½", pp. 160, with five text figures. Price: 8s. 6d.

THE regeneration of parts removed from animals and wound healing have aroused the curiosity of naturalists since the time of Aristotle and no doubt even much earlier. A vast amount of work has been done in following the sequence of events in the process and in trying to determine the cause of the various changes in all types of animals from protozoa to man. An attempt to give a clear summary of present knowledge on the subject is made by A. E. Needham in his little book. Here tissue regeneration in all types of animals is considered; an immense amount of experimental data is summarized; and, as there are only 132 pages of text and 573 references are given, the treatment is very concentrated. For this reason, among others, it is an extremely difficult book to read. Before even beginning to understand it the reader must have a considerable knowledge of comparative biology. As an example of the style of writing one sentence will suffice. "Recently mutations have been observed, chiefly in *Drosophila*, which regularly give homœotic heteromorphs in ontogenesis and the frequency with which the mutated gene expresses itself (its 'penetrance') is sensitive to changes in external conditions as are the experimentally-induced regenerative types." To the biologist, with a sufficient background, the book is recommended as a fairly complete, if brief, account of the present knowledge on the subject, but the reader with little knowledge of comparative zoology would be lost after the first few pages.

Modern Trends in Neurology. Edited by Anthony Feiling, B.A., M.D., F.R.C.P.; 1951. London: Butterworth and Company (Publishers), Limited. Sydney: Butterworth and Company (Aust.), Limited. 10" × 7", pp. 726, with 202 illustrations. Price: 89s. 6d.

THE editor of this volume in the "Modern Trends" series dealing with neurology is Anthony Feiling. The contributors to all but two chapters are also British. The chapters on headache and on the intervertebral disk are by American authorities noted for their work, E. C. Kunkle and H. G. Wolff on the former and W. J. Mixter on the latter subject. Each contributor writes from a large experience and appends a useful bibliography. Important clinical aspects are emphasized and discussions on ætiology, pathology and treatment are in general very good. That a few discussions are less satisfying is perhaps not the fault of the contributors but rather due to uncertainty about ætiology and to unproved hypotheses. In the section on meningitis the principle of giving massive doses of penicillin parenterally in the pneumococcal form is just recognized, but reference might have been made to the work of Dowling and others instead of to that of some less active exponents. The impression is given also that sulphathiazole is as good and as safe a drug in meningococcal meningitis as any of the group to which it belongs.

In the chapter on poliomyelitis confusion is still allowed to surround the term polioencephalitis.

The account of the frontal lobes and their functions by Denny-Brown is a profound pathological and physiological study. With its long list of references it must surely place before the reader almost all that is known of the subject. The main advances in neurosurgery and neurosurgical investigation are naturally included. Their importance does not need stressing as neurology's debt to neurosurgery is now so great.

The increasing recognition of cerebral angiomata and success in their removal might have been thought to justify attention to them by one of the clinical contributors. A succinct account of their main features has, however, been given by J. W. D. Bull in the chapter on diagnostic radiology. If neurology is indebted to neurosurgery, so are both heavily indebted to radiology, as the editor suggests in the preface. This chapter is of a high standard and should be read by every neurologist. The book can be recommended to those for whom it was designed. An added recommendation is the large clear type, and there are some good illustrations.

Operative Neurosurgery: With Emphasis on Procedures in Trauma. By Elisha Stephens Gurdjian, M.D., and John E. Webster, M.D.; 1952. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 10½" × 7", pp. 436, with 129 illustrations. Price: £5 7s. 6d.

THIS is the work of the professor and assistant professor of neurosurgery at the University Neurosurgical Service, Grace Hospital, Detroit, Michigan. As a well-written and illustrated text-book of its subject it must be given praise. The descriptions of the operations are simple and clear, and the accompanying plates drawn in bold contrasting lines are fully explanatory of the letterpress. There is throughout

the book a series of small print anatomical notations which, if written to enlighten a surgeon practising this specialty, would appear to be rather naïve.

A publication of this type may be, as this is, technically correct and beyond criticism as an exposition of classical and accepted neurosurgical technique. The reason for its having been written and the usefulness of its purpose are more doubtful matters. If any properly trained and experienced neurosurgeon were to turn to this work for help in a surgical dilemma he would not find it. If a neurosurgeon needed such guidance as it has to offer, he should be regarded as incompetent to practise. It must therefore be admitted that though this work represents a considerable labour of collation, and undoubted publishing skill, its usefulness is limited to the informing of the neurosurgically uninitiated. It is to be hoped that the simple line bloodless diagrams will not beguile such readers into endeavours whose dangers and difficulties cannot be hinted at by the surgeon's artist, and are not discussed at all by the authors.

Diseases of the Nervous System: Described for Practitioners and Students. By F. M. R. Walshe, M.D., D.Sc., F.R.S.; Seventh Edition; 1951. Edinburgh and London: E. and S. Livingstone, Limited. 9½" × 6¼", pp. 382, with 63 illustrations. Price: 24s.

NEW editions of this book appear with a rhythmicity reminiscent of a fundamental physical law—and nothing is better proof of excellence and appeal. It purports to describe nervous diseases for practitioners and students, and it fulfils "the task of selection, of emphasis and—in particular—of omission" in a manner which would be expected by those who know Dr. Walshe's genius. The combined qualities of brilliant clinical neurologist and scientist emerge from each printed page. The only regret to be expressed is that the flashes of wit which enliven Dr. Walshe's conversation and clinical rounds find little place in his book!

Students who use the book will not be frightened by the bogy of complexity which haunts some presentations, and will attain a sound clinical foundation, well correlated with their study of medicine in general. It does not aim to make a specialist of the student, the author realizing that this is undesirable and impractical. For these reasons the work is unhesitantly recommended to those to whom it is directed —and, indeed, it is probable that few neurologists have not read this text.

Correlative Neuroanatomy and Functional Neurology. By Joseph J. McDonald, M.S., M.Sc.D., M.D., and Joseph G. Chusid, A.B., M.D.; Sixth Edition; 1952. Los Altos, California: Univesrity Medical Publishers. 10½" × 7½", pp. 264, with 177 illustrations. Price: $4.00.

THIS book is the sixth edition of "Correlative Neuroanatomy" by McDonald, Chusid and Lange. The preface states that "This volume is dedicated to the beginner in neurology. Our aim is to present in the simplest and clearest manner those features of anatomy and physiology of the nervous system which bear upon the problem of clinical neurology." The bulk of the book has been increased from 150 pages in the fourth edition to 263 in the sixth. Thus much new material has been added.

The "concise outline format" will be of more value to some than to others. Some will learn from its perusal; others might experience a feeling of revulsion from which interest in neurology may never revive. Much knowledge which is useless to the student is included: and it is to be remembered that the greatest difficulty a student has is in gaining a proper perspective in medicine. Most practising neurologists would not understand many of the eponyms so freely used, for example, Souques' sign, Cestan-Chenais' syndrome, Lermoyez' syndrome, Howslip-Roberg syndrome and Brun's syndrome, and what value lies in the student's knowledge of such terms? The section of functional neurology, which describes neurological disorders, is too brief to be of value.

The book presents a great deal of material with extraordinary conciseness. The material is accurate, and the diagrams are, in general, excellent.

The impressions which one reader gains from a book may be entirely different from those which another might experience. The excellence of some books cannot be doubted by any; some books can be said to be bad and to lack a reason for being. Such a book as this does not fall into either class. It must be said, therefore, that much information has been compressed within the covers of this book and that much ingenuity has gone into its presentation and the construction of excellent diagrams. It is to be recommended as an excellent companion to neurology, and as a supplement to memory. To those who like their material in such a form, the book may be useful for purposes of study and systematization of knowledge.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Advances in Internal Medicine", edited by William Dock, M.D., and I. Snapper, M.D.; Volume V; 1952. Chicago: The Year Book Publishers, Incorporated. 9" × 6", pp. 464, with 119 illustrations. Price: $10.50.

Divided into nine sections, each dealing with an important subject which is discussed under many headings.

"The 1952 Year Book of Radiology (June, 1951-June, 1952)": Radiologic Diagnosis, edited by Fred Jenner Hodges, M.D., and John Floyd Holt, M.D.; Radiation Therapy, edited by Harold W. Jacox, M.D., and Vincent P. Collins, M.D.; 1952. Chicago: The Year Book Publishers, Incorporated. 9" × 6", pp. 416, with 387 illustrations. Price: $7.50.

One of the Practical Medicine Series of year books.

"A Guide to the History of Science: A First Guide for the Study of the History of Science with Introductory Essays on Science and Tradition", by George Sarton; 1952. Waltham, Mass.: The Chronica Botanica Company. Melbourne: N. H. Seward, Proprietary, Limited. 9½" × 6½", pp. 334. Price: $7.50.

Intended for scientists and scholars and also for historians of science. The first part of the book deals with the purpose and meaning of the history of science; the second is a bibliographic summary for the guidance of scholars.

"The 1952 Year Book of Pediatrics (June, 1951-May, 1952)", edited by Sydney S. Gellis, M.D., and Isaac A. Abt, M.D.; 1952. Chicago: The Year Book Publishers. 8" × 5½", pp. 424, with 112 illustrations. Price: $5.50.

One of the Practical Medicine Series of year books.

"Metabolic Interrelations: With Special Reference to Calcium: Transactions of the Fourth Conference, New York, January 7-8, 1952", edited by Edward C. Reifenstein, jnr., M.D., assisted by Shirley L. Wells, M.S. New York: Josiah Macy Junior Foundation. 9½" × 6½", pp. 262, with 50 illustrations. Price: $4.50.

A *verbatim* report of the conference in which there were 28 participants, the subject being discussed under 20 headings.

"Blood Clotting and Allied Problems: Transactions of the Fifth Conference, January 21 and 22, 1952, New York", edited by Joseph E. Flynn, M.D.; 1952. New York: Josiah Macy Junior Foundation. 9" × 6", pp. 368, with 148 text figures. Price: $4.95.

A *verbatim* report of the conference, the subject being discussed under seven headings.

"Psychology: The Study of Behaviour", by William McDougall, with an introduction by Cyril Burt; Second Edition; 1952. London: Geoffrey Cumberlege: Oxford University Press. Melbourne: Oxford University Press. 7" × 4½", pp. 210. Price: 7s. 6d.

One of the "Home University Library of Modern Knowledge" series. It is the nineteenth impression of the second edition. It is a widely known work which needs no introduction.

"Textbook of Public Health (Formerly Hope and Stallybrass)", by W. M. Frazer, O.B.E., M.D., Ch.B., M.Sc., D.P.H.; Thirteenth Edition; 1953. Edinburgh and London: E. and S. Livingstone, Limited. 9" × 6", pp. 674, with 76 illustrations. Price: 42s.

This edition has been revised to give an account of the changes in the public health and hospital services brought about by the *National Health Service Act*, 1946, and the *National Assistance Act*.

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL.

THE National Health and Medical Research Council holds two meetings each year, and it is at the second meeting, generally held in November, that grants for research are made. Dr. W. F. Simmons, the representative of the Federal Council of the British Medical Association in Australia on the National Health and Medical Research Council, has made his usual report to the President of the Federal Council. Several matters in this report are of such importance that they should be brought to the notice of the medical profession.

In the absence of the Minister for Health, the Right Honourable Sir Earle Page, Dr. A. J. Metcalfe, Director-General of Health of the Commonwealth, who is chairman of the Council, opened the proceedings. Readers are aware of the general function of the Council implied in its name. Dr. Metcalfe referred to a meeting of the public health committee which had been held in Melbourne. The Council then proceeded to consider the applications for grants. Apparently there is a good deal of laxity on the part of persons who apply for grants, because only three out of 78 applications had been received by the date on which they were due, September 30, 1952; two applications were received on the date of the meeting. This is something which the Council could easily prevent. The Council had available for allocation on October 31, 1952, a sum of £151,000. The amount asked for by applicants was £162,000. A moment's thought will show that the Council would experience some difficulty because of the rising costs of equipment for research, and also because of adjustments that have to be made in salaries on account of the cost of living. For this reason, the sum of £10,000 is generally held in reserve until the May meeting. The applications for grants are considered before the meeting of the Council by the Medical Research Advisory Committee, and on this occasion the Committee took two days for its deliberations. The Committee recommended to the Council that renewal grants should be made to research workers amounting in all to £106,925, and that new grants to the sum of £15,275 be made to new applicants. It is estimated that the cost of living adjustments to be made to the workers would amount to £12,800 if the cost did not vary for the next twelve months. The total amount paid to the research workers in question, exclusive of payroll tax and superannuation benefits paid in respect of certain senior research workers, was £135,000. Readers may remember that in their article on the opportunities for research in Australian medical schools, contributed to our Education Number last November, F. M. Burnet, F. J. Fenner and I. J. Wood pointed out that the medical requirements of the community are always changing, and that, if it is to have any social function, the objectives and techniques of medical research must constantly be adapted to changing circumstances. The National Health and Medical Research Council will be able to do a great deal of the necessary adapting, but if it is to do the job properly it must be supplied with sufficient funds. It is not unreasonable to suggest that the cost of living adjustment should not be paid out of the grant-in-aid made available to the National Health and Medical Research Council, but that it should be an extra charge on the Federal Treasury. It is to be noted that the Medical Research Advisory Committee recommended to the Council, and the Council later adopted the suggestion, that the salaries of senior research Fellows should be within the range of £1300 to £1500 *per annum*, *plus* the cost of living allowance. It is pathetic to think that this suggestion, in respect of senior research workers, should have been necessary. These workers are little better off than junior medical officers who enter the service of the Repatriation Department. It was noted at the recent meeting that a number of promising young medical graduates are prepared to adopt research as their life work. These graduates have good academic records and many of them have special science qualifications as well as their medical degrees. If senior research workers are paid something between £1300 and £1500 a year, we wonder what will be offered to these "promising young medical graduates" who are to adopt research as their life work. We hope that their youthful ardour will not be killed by financial coldness. One announcement made by the Medical Research Advisory Committee will be received with universal regret. Professor H. K. Ward resigned his membership of the Committee as from December 31, 1952. The hopes expressed by us in a recent editorial dealing with Professor Ward's retirement from the Chair of Bacteriology, that he would still be associated with the National Health and Medical Research Council, are unfortunately not to be realized.

The Council gave some consideration to the proposal that allowances should be paid to patients suffering from leprosy or Hansen's disease as it is sometimes called. The proposal had been discussed by the Council at its meeting in November, 1950, and a resolution was adopted suggesting that payments should be made to Europeans suffering from leprosy in the same way as sums of money are paid to sufferers from tuberculosis. This matter affects Queensland and Western Australia more than other States. Both the Director-General of Health of Queensland and the Commissioner of Health of Western Australia drew attention to the urgency of the problem, particularly in regard to the dependants of these patients. The matter was discussed at the recent meeting of the Federal Council and

it was resolved that the Minister for Health should be approached in the matter and asked that the same social benefits should be allowed to sufferers from Hansen's disease as to sufferers from tuberculosis.

The Council received an account of recommendations adopted at a conference of Commonwealth and State officers in regard to a proposed *Therapeutics Substances Act* to be adopted by the Commonwealth Parliament. The Council approved of the principles laid down and recommended that any action taken should be taken as a matter of urgency. Among these recommendations was one drawing attention to the urgent need for the establishment of a Commonwealth Standards Laboratory for testing therapeutic substances, with the object of ensuring that only drugs and medicines which conformed to prescribed, authoritative standards or quality were to be allowed to enter, or to be used in, Australia. Another recommendation was that State governments should develop legislation of a uniform pattern to provide for the licensing of the manufacture of drugs and medicine in each State. It was thought that the Commonwealth should undertake to submit draft legislation for this purpose for consideration by the States. It was further recommended that an expert committee should be set up to advise the Commonwealth and the States on suitable standards for drugs not yet included in the British Pharmacopœia or in other recognized pharmacopœias, and on matters incidental thereto. It was also thought that the Commonwealth Government should enact legislation to the limit of its constitutional powers relating to the standard of purity of drugs used as therapeutic substances. This matter has been considered by the Federal Council. It is a matter of great importance, but also of considerable difficulty and expense.

Current Comment.

HEPARIN THERAPY OF SEVERE CORONARY ATHEROSCLEROSIS AND ANGINA PECTORIS.

DURING the past two years Gofman and his associates in California have been studying serum lipoprotein complexes with the aid of an ultracentrifuge. They have shown that the plasma lipoids are carried in the form of lipoproteins of varying molecular size, and they claim that the lipoproteins of relatively large mass which they class as S_f 12-20 are associated with atherosclerosis in humans and in cholesterol-fed rabbits. This work was reviewed in this journal on July 26, 1952. It has been known for some time that heparin in some way affects fat transport in the blood and that alimentary lipæmia in various animals and man could be cleared by injection of heparin. The California workers showed that, after an injection of heparin, there is a shift of serum lipoproteins from the larger atherogenic classes to the smaller monatherogenic classes. Following this lead they found that the administration of 20 to 100 milligrammes of heparin produced dramatic relief of *angina pectoris* in 30 of 32 patients for periods of three to ten days following a single injection. Hyman Engelberg has made a detailed study of twenty-nine patients with severe angina, treated with heparin for a period of six to twelve months.[1] Careful selection was made of the cases studied because of the variability of *angina pectoris* and the difficulty of determining therapeutic response. Only those cases were included in which angina was over one year in duration, in which the clinical picture was fairly constant and in which the patient seemed reliable. No changes were made in the general care of the patients and heparin was the only additional therapeutic agent given. Eighteen of the patients had previously experienced an acute myocardial infarction, eleven had not. Heparin was given in doses of 25 to 100 milligrammes intravenously or intramuscularly twice weekly. The best results were obtained with 100 milligrammes given intravenously. The condition of twelve of the initial eighteen patients improved with heparin. When saline placebos were substituted in a few cases the angina recurred in from one to eight weeks. The same lag, before recurrence of symptoms, also took place when heparin was stopped. The response to heparin may be very marked, occurring within several hours after the first dose, or it may occur gradually over a period of months. In the latter case the improvement is moderate. Most of the patients showed a gradual type of response and slightly more than half of the patients treated, who had not responded to previous therapy, showed worthwhile improvement particularly in their reaction to effort. In a few cases the improvement was considerable.

In an attempt to obtain objective criteria of therapeutic response nine patients who had a positive two-step exercise electrocardiogram were studied. A standard Master two-step test was done, the anginal response noted and an electrocardiogram taken. The two-step test was repeated after the injection of 100 milligrammes of heparin ten minutes, six hours and twenty-four hours after the injections. Six out of the nine patients showed an increased exercise tolerance after heparin. The ballistocardiogram was also used as an objective aid in evaluation of the treatment. It is claimed that the ballistocardiogram is more closely related to the heart's force than to its output. Improvement was seen in about half of the patients given heparin. It is probable that the beneficial effects of heparin are not due primarily to its anticoagulant or vasodilating effects. The prolonged relief following cessation of therapy and the results of the two-step exercise are evidence of this. It is probable that the action of heparin on the serum lipoproteins bears some relation to its effect upon the manifestations of coronary atherosclerosis. The shift in the serum lipoproteins cannot alter existing atherosclerotic disease when the improvement occurs within six hours of heparin injection, as is often the case. The use of heparin affords a possibility of a new approach to the prevention and treatment of atherosclerosis since it is a physiological substance having a profound action on the plasma lipoproteins.

[1] *Am. J. Med. Sci.*, November, 1952.

SUCCINYLCHOLINE AND MUSCLE RELAXATION.

FOR several years great interest has been shown in the use of substances which have a curare-like action in bringing about relaxation of muscle during anæsthesia. First curare itself was used, but it had many disadvantages. Then derivatives of curare and other synthetic substances were tried, but all produced more or less marked respiratory depression and sometimes transient respiratory arrest. Other undesirable effects were often produced. The prolonged action of some of the substances was sometimes troublesome. In 1949 Bovet observed the neuro-muscular blocking effect of succinylcholine and a number of workers have since investigated its action. Its action on muscle is intense, brief and reproducible. The short duration of action of a single intravenous dose is attributable to the rapid enzymatic hydrolysis of succinylcholine by cholinesterase. Succinylcholine has two choline groups attached to succinic acid. V. P. Whittaker and S. Wijesundera[1] have recently shown that cholinesterase of blood rapidly splits off one choline to give succinylmonocholine which is then more slowly broken down to choline and succinic acid. It is probable that the succinylmonocholine has little or no action on muscle. F. F. Foldes, P. G. McNall and J. M. Borrego-Hinojosa have given a complete account[2] of the use of succinylcholine in producing muscular relaxation during anæsthesia. The

[1] *Biochem. J.*, November, 1952.
[2] *New England J. Med.*, October 16, 1952.

observations were made on 202 unselected consecutive patients in whom the use of a muscular relaxant was indicated. After premedication with pentobarbital, atropine or scopolamine and morphine patients were anæsthetized by the intravenous injection of 2·5% "Pentothal Sodium" solution. Tracheal intubation was also used. A continuous intravenous drip of 0·2% solution of succinylcholine di-iodide in physiological saline or in 5% dextrose in water was started immediately after intubation. The degree of muscular relaxation required was obtained by regulating the rate of flow of the solution. Muscular relaxation developed in 45 to 60 seconds, reaching its maximum in 60 to 90 seconds. Muscular relaxation could be maintained by the continuous intravenous infusion of 1·1 to 9·2 milligrammes of succinylcholine di-iodide per minute. There was very little respiratory depression and assisted respiration was seldom necessary. The effect on muscular relaxation and respiratory depression disappeared in all cases within two to four minutes after discontinuance of the injection. One great advantage over other muscle relaxants is the easy controllability which permitted almost instantaneous changes in the degree of muscular relaxation to occur. Another is the lack of residual respiratory depression frequently seen with other relaxants due to the very rapid breakdown in the body of succinylcholine to normal body constituents. The disadvantages of succinylcholine are few and not serious. Administration requires greater attention on the part of the anæsthetist, and somewhat higher doses of "Pentothal Sodium" per minute are required to maintain comparable depth of anæsthesia than with other synthetic muscle relaxants. Several cases of prolonged respiratory depression after the use of succinylcholine have been reported by other observers, but the authors point out that unnecessarily high doses were used in these cases. Low plasma cholinesterase levels could be detected from the effects of the initial dose of succinylcholine and the maintenance dose could be adjusted to the needs of the patient.

BONE GRAFTING AND BONE BANKS.

BONE grafting is well established in surgical practice. Clinical experience has shown that autogenous grafts (those taken from another part of the same individual) produce the best results, and they are the most commonly used. Heterogenous grafts (those from another species) have been tried, but have been generally discarded as unsatisfactory; they act, in fact, as foreign bodies. Homogenous grafts (those from other individuals of the same species) are satisfactory, although healing is a little slower than with autogenous grafts. In practice the use of homogenous grafts has obvious advantages, and is gaining increasing support. Their present importance appears to follow largely on work reported by Inclan in 1942 and is related particularly to the development of bone banks. The fate of bone grafts has been much discussed. P. D. Wilson,[1] writing in 1947, had been able to find no essential difference between the ultimate fate of directly transplanted autogenous bone and that of homogenous bone used after refrigeration and storage. Clinical and histological studies indicated that in both cases the bone was resorbed and transformed into living bone entirely as the result of the action of the host tissues. No evidence was obtained that the cells of the bone transplants survived in either case. In 1951, after considerable further experience, Wilson's views on the fate of the grafts were apparently much the same.[2] They are supported by a number of investigators who have reported their findings in the past few years, for example, F. C. Reynolds and D. R. Oliver,[3] and J. F. Le Cocq *et alii*;[4] but the matter is not finally settled. Whether cells survive or not, autogenous grafts and, apparently, homogenous grafts behave very differently from deliberately devitalized grafts. C. L. Kiehn *et alii*[1] investigated the uptake of radioactive phosphorus by samples of normal bone, by reimplanted autogenous frozen bone grafts and by grafts that had been devitalized by boiling. The frozen grafts, which had been stored for six weeks, behaved much the same as the control samples of normal bone and quite unlike the devitalized bone, in which apparently no metabolism of phosphorus was occurring. However this may be, success with a graft appears to depend on what Le Cocq *et alii* describe as its "affinity to revascularization". On this basis and as the result of more recent investigations, Kiehn *et alii*[2] place the various types of bone graft in the following order of preference: autogenous grafts, frozen autogenous grafts, fresh homogenous grafts, boiled or avital bone grafts. They consider that homogenous grafts should not be used if autogenous transplants are available; and with this there will be general agreement amongst those who have studied the matter, whether clinically or experimentally. In practice, however, homogenous grafts offer great convenience and may be the only type possible. Here the bone bank is proving its worth. Methods of preservation in the bank are still being developed. The generally used method has been one of freezing. F. C. Reynolds *et alii*[3] have reported satisfactory results from the use of "Merthiolate", which they consider easier and more economical of bone than freezing. They found no evidence of sensitivity to the "Merthiolate" or of excess tissue reaction to the "Merthiolate"-preserved bone. As might be expected, the "Merthiolate"-preserved bone did not compare favourably with autogenous bone grafts. More recently F. P. Krauz *et alii*,[4] with corroborative support from E. W. Flosdorf and G. W. Hyatt,[5] have described the use of freeze-drying processes. These are considered to be superior to ordinary freezing as methods of preservation and have other practical advantages when the bone is to be shipped elsewhere, as it has been during the present war in Korea.

[1] *Ann. Surg.*, December, 1947.
[2] *J. Bone & Joint Surg.*, April, 1951.
[3] *J. Bone & Joint Surg.*, April, 1950.
[4] *Surg., Gynec. & Obst.*, September, 1950.

SEQUELÆ OF BULBAR POLIOMYELITIS.

IT has usually been thought that persistent disability from bulbar poliomyelitis rarely occurs. This view is not supported by the findings of Wallace Lueck *et alii* in a review of patients who survived an attack of bulbar poliomyelitis in the Minnesota epidemic of 1946.[6] During their acute illness these patients had a variety of cranial nerve palsies, the most common being pharyngeal weakness; and then, in order, came impairment of the muscles of the face, of mastication and of the tongue. Altogether 50 patients were reviewed from fifteen to seventeen months after their initial illness; of these, 45 still complained of symptoms of cranial nerve involvement, and 36 had corresponding demonstrable physical findings. The pharynx was most often involved, the patients needing to chew food very completely and swallow it slowly and in small amounts or to wash it down with liquids. Choking, gagging, gulping and regurgitation were common. Nasal regurgitation of liquids persisted in 16 cases, and often the voice was nasal. Paralysis of the palate could be observed in 25 cases, but in some of these cases the patients were free of symptoms. Ten patients complained of hoarseness or a lowering of pitch of the voice, and in three of these unilateral vocal cord paresis could be seen. Twenty-five patients had had an initial facial paralysis, and this had persisted in 17 cases. It was noted that the disabilities tended to increase during periods of intercurrent illness, fatigue or emotional disturbance. Lueck and his colleagues mention other reports which give a very much higher recovery rate after poliomyelitis involving the cranial nerves.

[1] *Ann. Surg.*, September, 1950.
[2] *Ann. Surg.*, September, 1952.
[3] *J. Bone & Joint Surg.*, October, 1951.
[4] *Arch. Surg.*, February, 1952.
[5] *Surgery*, May, 1952.
[6] *J. Pediatrics*, November, 1952.

Abstracts from Medical Literature.

DERMATOLOGY.

Nummular Eczema as a Clinical Entity.

P. CROSS (*New York J. Med.*, September 18, 1951) states that in order to recognize nummular eczema one must be guided not only by the clinical appearance, but also by its typical history, its clinical behaviour and its therapeutic response. The main clinical characteristics of nummular eczema can be summarized as follows. The eruption consists of coin-shaped patches of eczematous dermatitis in various stages of evolution. The fully developed lesion is an erythematous plaque which is studded with usually small vesicles, papulo-vesicular lesions or pinhead-sized crusts. The diameter of the patches varies from that of a dime to the size of the palm. When a patch of nummular eczema undergoes involution, the erythema and œdema may subside completely, while discrete papules and vesicles remain throughout the affected area. At times central healing is observed. Recurrences after temporary healing reappear at the previously affected sites. Persistent patches may become lichenified without having the tendency to vesicle formation. When oozing occurs, it is usually from small pin points. The typical distribution of nummular eczema, be it vesicular or rhagadiform, is on the exterior surfaces of the extremities, including the dorsum of the hands and feet. The disease is more frequent in adults than in young people. The whole skin surface should be examined, and some of the criteria to be looked for are asteatosis or xerosis with ichthyosiform or fine bran-like scaling over the exterior surfaces, and dryness, scaling and *lichen pilaris* over the elbows, knees and buttocks. In discussing the ætiology, the author mentions the recurrence associated with cold weather and the sensitivity to soap, alkalis, drying lotions and baths. For treatment, in addition to the avoidance of soap and alkalis, it is necessary to protect the skin of the nummular eczema patient against friction and pressure and the drying effect of cold, wind and infection. For treatment of the eczematous lesion, keratoplastic remedies are used, best represented by tar applied in a paste or ointment; crude coal tar is mostly used. Metabolic disturbance of the skin is corrected by dietary therapy, consisting of the administration of vitamin *A*, milk, and a diet of high protein, high vitamin and moderate fat content.

Tinea Capitis Caused by Trichophyton Tonsurans.

J. B. HOWELL, J. W. WILSON AND M. C. CARO (*Arch. Dermat. & Syph.*, February, 1952) state that scalp infections caused by *Trichophyton tonsurans* differ in many respects from those due to species of *Microsporum*. The former should be suspected when the involved plaques tend to be angulated or polygonal rather than rounded, when the hairs are seen to be broken off so close to the surface of the scalp that they appear as black dots, and when infection is unduly prolonged or continues after puberty. Fluorescence is almost uniformly not observed, direct microscopic examination of involved hairs reveals endothrix infection, and culture yields an easily differentiated growth. The clinical course of any single plaque of the disease usually includes three stages which lend themselves to separate discussion, although all three stages are usually present simultaneously in the same patient. In the epidermal stage there are patches simulating seborrhœic dermatitis. The infection is very pruritic and excoriations are usually present. Microscopic and cultural studies will either confirm or rule out the possibility of *tinea capitis*. The next stage is the follicular invasive phase, when the infection invades the follicle, going thence to the hair shaft and root. Fracture of the pilus then occurs. Soon broken hairs are found and small patches of alopecia occur, exhibiting in adults atypical and unusual shapes, some finger-like, some roughly rectangular and some oval in pattern but having irregular borders. In contrast to *Microsporum* infections, areas of baldness frequently contain a sprinkling of normal full-length hairs. The length of the broken hairs is variable, and fracture of the hair generally occurs at the level of the scalp, producing a "black dot" appearance. Folliculitis is present in the most active portions of any plaque, usually near the periphery; associated pyogenic infection results in crusting. Kerion frequently develops, especially in children. The specific diagnosis depends upon microscopic examination of the involved hairs and scales as well as upon cultural studies. The healing stage occurs because the infected hairs have left the follicles, either spontaneously, as a result of treatment, by epilation, or through the development of kerion. Permanent thinning of the hair is infrequent unless kerion is present with resulting atrophic scarring. The foregoing portrays the disease as it occurs in children. The authors had two adult patients with infection of the scalp which exhibited a stage in which a clinical appearance closely simulated *lupus erythematosus*. They state that in the cicatrizing variety of *T. tonsurans* infections there seems to be a tendency for spontaneous healing and "burning out" of the process locally after a period of months or years. The atrophic phase must be differentiated from the terminal stages of *lupus erythematosus* and *folliculitis decalvans*, from *alopecia cicatrisata* and the end stage of favus and other *T. endothrix* scalp infections. There is doubt that the infection in adults ever heals spontaneously. Topical therapy is of questionable value. Manual epilation is very difficult, since most of the hairs are broken off at the scalp surface. X-ray epilation is the treatment of choice in both adults and children. This should be followed by the manual removal of every hair which is not shed after the X-ray epilation.

Effect of ACTH on Hair Growth in Alopecia Areata and Universalis.

R. A. WILSON (*Lancet*, March 29, 1952), in a preliminary report, states that in spite of the facts that numerous endocrine substances have been used without success in the treatment of *alopecia areata*, that clinical evidence suggests that in hyperadrenocortical syndromes reduced hair growth occurs on the scalp, and that ACTH has been found to inhibit hair growth in rats, he has successfully treated four patients with alopecia by means of ACTH. Of the four patients, three had had *alopecia universalis* for one to three years, and since the complete loss of hair there had been no recent partial remission. The fourth patient had had severe partial alopecia for a year with spontaneous exacerbations and remissions. The adults were given ACTH intravenously in a 5% glucose solution by drip administration for twelve hours daily. The dose varied between 15 and 20 milligrammes. To the children ACTH was given intramuscularly in a dose of 40 to 60 milligrammes daily in four divided doses. The following observations were made: (i) daily measurement of blood pressure, body weight and fluid balance; (ii) twice weekly estimation of blood levels of proteins, cholesterol, sodium, potassium and chlorine, and of the alkali reserve; (iii) weekly complete blood count, including total eosinophile cell count, and estimation of the erythrocyte sedimentation rate. Treatment lasted from six to eight weeks. Benign symptoms of intolerance were usually noted after three or four weeks' treatment. At this time dosage was usually reduced. In three cases of *alopecia universalis*, hair began to grow in eight to ten days, and there was a satisfactory growth in twenty-one days. This resultant hair growth was sustained only while ACTH administration was maintained at a high level. In one case of partial alopecia, the bald patches became covered with hair and the hair continued to grow normally after cessation of treatment. This may have been a natural remission. The results indicate the need for investigating the following possibilities: (i) that ACTH permits regrowth of hair owing to its effects on the inflammatory exudate round the hair follicles; (ii) that this phenomenon is due to inhibition of an allergen antibody response by ACTH; (iii) that ACTH simply increases the blood supply to the affected hairs; (iv) that some hormone is elaborated by the adrenal cortex in man which has a specific stimulating effect on the pilary system.

Topical Chloramphenicol Therapy of Pyogenic Dermatoses.

E. R. TRICE AND J. C. SHAFER (*J.A.M.A.*, August 16, 1952) state that in the evaluation of a new topical agent for the treatment of pyogenic infections of the skin, two basic factors must be observed. The agent must possess a bacteriostatic effect, preferably in low concentrations, against a wide spectrum of microorganisms that commonly affect the skin, and it must also show a low index of cutaneous sensitivity. The authors' report evaluates topical chloramphenicol therapy with reference to effectiveness in the treatment of pyodermas, to cutaneous allergenicity and to applicability in a greaseless base. The authors applied patch tests of 2% chloramphenicol cream to 100 consecutive patients admitted to an army hospital.

A total of 50 patients were retested fourteen days later. No positive reactions occurred to either the original or the provocative tests. The authors state that a wide spectrum of micro-organisms that commonly cause pyogenic infections of the skin are susceptible to chloramphenicol. A total of 86 patients with superficial and deep pyodermas were treated with chloramphenicol cream, the latter having an oil-in-water base. Favourable responses were noted in the treatment of superficial infections. The oil-in-water emulsion base afforded an efficient vehicle for the drug in the treatment of hairy and intertriginous areas. Results were favourable with deeper infections when they were treated early in the acute phase. In other chronic cases, chloramphenicol was no more effective than other antiseptic preparations.

UROLOGY.

Vesico-Rectal Anastomosis in Ectopia Vesicæ.

W. H. BOYCE AND S. A. VEST (*J. Urol.*, April, 1952) describe a new principle of surgical treatment of *ectopia vesicæ*. The object is to obtain a fairly normal life expectancy, which cannot be hoped for after bilateral transplantation of the ureters. The exstrophy is left undisturbed until the patient is five to seven years of age. As a rule no infection of the kidneys occurs in these early years, and there is only little psychological damage from the presence of the malformation. The first procedure is to establish a permanent colostomy at the junction of the middle and lower thirds of the sigmoid colon, with closure of the distal stump. Two weeks later an attempt is made to sterilize the blind recto-sigmoid colon by means of instillations and enemas containing antibiotics. Then a longitudinal (sagittal plane) incision is made through the trigone of the bladder and through the anterior wall of the rectum, which is just behind the trigone. By lateral sutures a permanent wide fistula between the two organs is made. Thus the ureteric orifices and lower parts of the ureters are not touched or disturbed. The cul-de-sac of peritoneum is opened, but is closed again by suture. A circular incision is then made around the entire base of the bladder, being kept well away from the ureteric orifices. This incision is carried through the entire bladder wall, with the exception of the peritoneum. The entire bladder base, isolated in this way, is turned up and closed over to form a cavity, by means of a chromicized gut continuous suture. The capacity of this cavity is, of course, very small, but it is really little more than a small "diverticulum" on the anterior rectal wall. Urine pours freely from this "diverticulum" into the rectum, and urinary continence is effected by the rectal sphincter. The peripheral portion of the bladder mucosa is now excised, the muscular layer of the bladder wall being left intact. This is sutured as a buttress over the little cavity just made. A urethra is then constructed with the mucosa on the floor of the epispadiac penis. This reconstructed urethra ends blindly, proximally, since the bladder was completely closed, but the ejaculatory ducts open into it, and the patient should be able to use the canal for ejaculation only. The abdominal wall defect is closed by fascia or muscle or by whatever structures are available. The colostomy may be excluded either earlier or later, but it seems to the authors that continuation of the colostomy is a lesser evil than the hazard of renal infection. The authors report on the successful application of this principle in a nine-years-old boy and a ten-years-old girl.

Phæochromocytoma.

G. F. CAHILL (*J. Urol.*, June, 1952) states that for an unusual and infrequent neoplasm, phæochromocytoma has received considerable attention, but there still seems to be a lack of agreement on the various tests used for diagnosis. Such a tumour should be suspected in any hypertensive patient who suffers from vasomotor attacks or hypermetabolism. The symptoms and signs seldom depend on pressure or displacement effects, but rather upon secretion by the tumour of hormones with many and varied actions. The main action substances produced are epinephrine and nor-epinephrine. These tumours can occur in the abdomen or chest, outside the adrenal, and in these situations some of them produce no symptoms at all. They occur most commonly in adult females, less often in adult males. Multiple tumours occur in 10% of cases. They occur most often in the adrenal medulla, next in the retroperitoneal ganglia. Most of the tumours are benign, and if they are recognized and removed, cure can be expected in most cases provided the patient survives the hazards of the operation period. The presenting symptom is hypertension, with or without paroxysmal crises. No patient with hypertension should be subjected to any radical procedure, such as lumbodorsal sympathectomy, without previous exclusion of the presence of phæochromocytoma by pharmacological methods. The pharmacological tests are (i) epinephrine and nor-epinephrine provocative tests, and (ii) tests with antagonists of the same two substances. The best provocative test is the intravenous injection of 0·05 gramme of histamine base. After a very short initial drop in blood pressure, a considerable rise occurs associated with pre-cortical and abdominal pain, headache, nausea and severe sweating. The duration of the crisis is short. No sedation is allowed for twelve hours before the test. The test has a high degree of accuracy. It should not be used in older persons, or in any patient with severe arterial changes. As an antagonist benzodioxane has been found very useful. This is given intravenously, in a dose of 0·25 milligramme per kilogram of body weight, and has a depressor effect in cases of hypertension with phæochromocytoma; with hypertension from other causes it has a pressor effect. The accuracy of the test is over 90%. Pyelography may show displacement of the kidney downwards by the tumour mass. Perirenal air insufflation may be of the greatest value. Even if a neoplasm exists in a sympathetic ganglion it may be outlined in some cases by air. The treatment is surgical removal of the tumour or tumours, if multiple. As a pre-operative drug, "Dibenamine" is useful. It causes lowering of the blood pressure, and manipulation of the gland is made safer because of this. However, not too much should be given, otherwise it will prevent the pressor effect of any sustaining drug, such as epinephrine or nor-epinephrine, when used to counteract the severe fall in blood pressure that may occur after removal of the tumour. The dose is five to seven milligrammes per kilogram of body weight, given in an intravenous infusion of 300 to 500 millilitres of saline, slowly over one hour. The reduction of blood pressure lasts twenty-four to seventy-two hours. Operation is performed in the later part of the period of depressor effect. However, if the operation technique is careful, as with particularly complete vascular severance before handling of the tumour, such sympathicolytic drugs may not be necessary. The severe hypotension and circulatory collapse after excision of the tumour are best controlled by intravenous drip administration of nor-epinephrine, four milligrammes per litre. The drip administration should go on for about three days, and should be at a rate that will maintain moderate hypertension. The author prefers a transverse upper transperitoneal approach. Great care should be taken of the *vena cava* with large tumours on the right side.

Protective Urinary Colloids.

A. J. BUTT (*J. Urol.*, April, 1952) states that the urinary colloids are an important, but very neglected, factor in the study of calculus formation. These tiny particles are highly important in preventing the conglomeration, agglutination and precipitation of crystalloids. Yet, when there is derangement of the colloid mechanism, there is produced a substance which may cement the crystalline material into a stone. Concentration of urine, as with the dehydration due to dry heat, relatively increases the proportion of crystalloids to colloids, with tendency of the latter to be precipitated. Colloidal activity can easily be measured, and it is noted that this activity is greater in the Negro race than in whites. Correspondingly, the incidence of stone formation is comparatively low in Negroes. An analysis of 185 cases of renal lithiasis met with by the author in two years in West Florida revealed the fact that only a little over 2% of the patients affected were Negroes, even though about 10% of the patients seen by the author are Negroes. Colloidal activity is also increased in pregnancy. The author states that this offers an explanation of why pregnancy, even though associated with dilatation and stasis in the upper part of the urinary tract, as well as increased excretion of calcium, is not more often complicated by urinary calculi. It has been found that the subcutaneous injection of 0·02 milligramme of hyaluronidase dissolved in one millilitre of saline significantly increased colloidal activity. The few patients who showed no increase were found to be those who harboured renal calculi. The greatest response was in Negroes. Urine specimens from patients who had received hyaluronidase could stand for long periods of time without undergoing sedimentation.

Special Articles for the Clinician.

(CONTRIBUTED BY REQUEST.)

LVI.

THE ANTIHISTAMINICS.

Histamine.

HISTAMINE was first made synthetically in 1907. It is closely related to the essential amino acid histidine, having one CO_2 molecule less. Dale and Laidlaw in 1910 showed that its effects resembled those of anaphylaxis, which was also under close study at that time.

Lewis and Grant (1924) showed that a histamine-like substance is liberated from tissue cells as a result of injury. Although this has not been recovered in sufficient quantity to be chemically identified as histamine, its physiological effects resemble those of histamine so closely that Dale, in his Croonian lectures in 1929, accepts the two as identical.

It has been clearly shown that histamine exists, preformed, in living cells, and after cellular injury or death its concentration is much less (Thorpe, 1928).

Although the effects of histamine vary qualitatively as well as quantitatively from one animal species to another, generally speaking it causes capillary dilatation and increased permeability with fall in blood pressure, flushing of the skin and weal formation, contraction of smooth muscle, particularly that of the uterus, intestines and bronchi, and stimulation of certain secretory glands, particularly those of the stomach.

The Relationship of Histamine to Anaphylaxis.

Although Dale and Laidlaw showed in 1911 that the effect of histamine closely resembled that of anaphylactic shock, it was soon apparent that it did not reproduce exactly the anaphylactic state. For instance, the decreased coagulability of the blood and the occurrence of purpura, both well known in association with anaphylaxis, do not occur with histamine.

The concept that seems to fit all the experimental observations is as follows. As a result of an antigen-antibody reaction either on the surface or within susceptible cells, the cells themselves are damaged. This leads to the liberation of cell contents, including histamine, which produce maximal effects at the site of the reaction but also diffuse into the blood-stream, causing general reactions. Heparin and choline among other substances may also be liberated and act as toxins.

The clinical manifestations are thus due to (i) cellular damage (purpura and hæmorrhage into liver, intestines, kidneys *et cetera*), (ii) histamine release (erythema, weals, vesiculation, bronchial constriction, congestion of mucous membranes *et cetera*), and (iii) other toxic effects (due to heparin, choline *et cetera*).

These multiple pathogenetic factors must be considered in assessing the value of antihistaminic therapy.

Principles of Treatment.

It is obvious that the most effective therapy of allergic conditions must be directed to the antigen-antibody reaction, either by elimination of the antigen or by desensitization. In many cases this is not practicable, and it is not surprising that investigators turned to combating the effects of histamine. This may be attempted in one of the following ways:

1. Use of an agent which has the reverse physiological effect of histamine, such as adrenaline for bronchoconstriction.

2. Destruction of histamine. A histaminase has been found to occur naturally, but the enzyme is not effective therapeutically.

3. Desensitization of the tissues to histamine.

4. Administration of a substance which blocks the effects of histamine, perhaps by competing in the metabolic processes of the target organ.

The desensitizing of tissues to histamine, though widely practised, has not been clearly shown to be effective. It is based on the concept that patients are allergic because they are abnormally sensitive to histamine, but this is quite unproven, and it is more likely that histamine acts as a simple toxin.

A different approach to the question of sensitivity to histamine is that of Fell *et alii* (1943), who stated that normal individuals developed antibodies to histamine, thus rendering it inactive. Subjects were allergic because they failed to produce such antibodies. They suggested the use of a histamine-protein conjugate with the idea that the combination would be antigenic, the histamine acting as a hapten. The antibodies so formed would inactivate histamine occurring naturally. The method has been implemented commercially in histamine azo-protein ("Hapamine"). Subsequent experiments, however, have failed to confirm the theoretical observations, and clinical trials have not shown the method to be effective.

The antihistaminics probably belong to group 4 above. Early investigations showed that certain amino acids (arginine, histidine) exerted such an effect but were too toxic for therapeutic use. The observation of Fourneau and Bovet (1933) that combinations of the ethylenediamine radical were effective led the way to the introduction of the antihistaminics in current use. In 1942 Halpern in France described the therapeutic use of "Antergan" and later "Neoantergan" ("Anthisan"). "Phenergan" in 1944, and "Diatrin" in 1947 were introduced in Europe. "Benadryl" introduced in 1945 and "Pyribenzamine" in 1946 were the first of this type produced in America.

In the ten years there has been a flood of related compounds and literature describing their experimental evaluation and clinical trials. The preparations available in Australia at present are shown in Tables I and II.

Pharmacology of the Antihistamines.

Apart from the effects on histamine-induced reactions, the antihistaminic drugs exert a local anæsthetic effect and in man, though not in animals, a sedative effect. When applied to the skin as a cream a number of the preparations absorb the ultra-violet rays of the sun and thus prevent sunburn.

They antagonize the effect of histamine on smooth muscle and on capillaries, but do not prevent the histamine stimulation of gastric secretion.

A fully documented review of history, chemistry, pharmacology and clinical applications of the antihistamines has been published as a monograph by Feinberg *et alii* (1950).

Therapy.

General Observations.

The use of antihistaminic drugs is at best a compromise. They do not modify in any way the underlying antigen-antibody reaction, and while this persists symptoms will recur as soon as administration is stopped. Specific therapy should be directed to this basic reaction by eliminating the antigen or desensitizing the subject.

In some circumstances the preparations may serve as a useful diagnostic tool. A skin rash of doubtful cause or recurrent nasal congestion may be alleviated with antihistaminics, an effect indicating an allergic basis. Such a test should, of course, be interpreted with caution.

Estimates of potency of various preparations are based on clinical impressions or bio-assay with histamine injection or standardized anaphylactic reactions in animals. The difficulties of quantitative assessment are thus very great. However, it seems clear that there is no particular preparation which is better than others, either in general or for a specific disease.

As in all therapeutics, should a partial response be obtained, the dose should be increased until relief is satisfactory or until side effects become troublesome. It may be necessary to use two, three or four times the usual dose.

There is considerable variation in individual response both in relief of symptoms and in toxicity. When an effect is not obtained with one preparation or when side effects are troublesome, several other preparations should be tried in rapid succession.

The therapeutic effect lasts about six hours. When the allergic condition recurs at regular itnervals, a single dose appropriately timed may be effective. When a continuous effect is required, administration should be at six-hourly intervals.

Children tolerate the antihistaminics well. If the child is aged over fourteen years the adult dose should be given, from five to fourteen years one-half of the adult dose, and from two to five years one-third of the adult dose. Most fatal poisonings have been in infants, and for those under two years of age the dose should be from 5% to 20% of the adult dose.

TABLE I.
Antihistaminics.

Trade Name.	Abbreviated Chemical Name.	Drug House.	Preparation.	Content.
"Allecur"		Schering.	Tablets.	20 milligrammes.
			Ampoules.	10 milligrammes per millilitre.
"Antistine"	Antazoline hydrochloride.	Ciba.	Tablets.	50 and 100 milligrammes.
			Ampoules (two millilitres).	50 milligrammes per millilitre.
			Nasal drops.	0·5% + 0·025% "Privine".
"Anthisan"	Mepyramine maleate.	May and Baker.	Tablets.	50 and 100 milligrammes.
			Ampoules (two millilitres).	25 milligrammes per millilitre.
			Cream.	2%.
			Elixir.	25 milligrammes per drachm.
"Benadryl"	Diphenhydramine hydrochloride.	Parke Davis.	Capsules.	50 milligrammes.
			Vials (10 millilitres).	10 milligrammes per millilitre.
			Elixir.	10 milligrammes per millilitre.
			Cream.	2%.
'Chlor-Trimeton"	Chlorprophenpyridamine maleate.	Schering.	Tablets.	4 milligrammes.
"Diatrin"	Metaphenilene hydrochloride.	Warner.	Tablets.	50 milligrammes.
"Di-paralene"	Chlorcyclizine hydrochloride.	Abbott.	Tablets.	25 and 50 milligrammes.
"Histostab"	Antazoline hydrochloride.	Boots.	Tablets.	100 milligrammes.
			Ampoules (two millilitres).	50 milligrammes per millilitre.
"Neohetramine"	Thonzylamine hydrochloride.	Wyeth.	Tablets.	25, 50 and 100 milligrammes.
"Perazil"	Chlorcyclizine hydrochloride.	Burroughs Wellcome.	Tablets.	50 milligrammes.
"Phenergan"	Promethazine hydrochloride.	May and Baker.	Tablets.	10 and 25 milligrammes.
			Ampoules (two millilitres).	25 milligrammes per millilitre.
"Pyribenzamine"	Tripelennamine hydrochloride.	Ciba.	Tablets.	50 milligrammes.
"Tagathen"	Chlorothenylpyramine hydrochloride.	Lederle.	Tablets.	25 milligrammes.
"Thenfadil"	Thenfadil hydrochloride.	Stearns.	Tablets.	15 milligrammes.
"Thephorin"	Phenindamine.	Roche.	Tablets.	25 milligrammes.
			Ointment.	5%.
			Lotion.	5%.
"Thenylene"	Methapyrilene hydrochloride.	Abbott.	Tablets.	50 milligrammes.

Administration is usually by the oral route. When there is urgency preparations for intravenous injection are available. Topical application by means of creams, eye drops and aerosol sprays is possible and may be more effective than oral administration.

More potent preparations, such as "Phenergan", "Pyribenzamine", "Benadryl", "Diatrin", "Trimeton" and "Anthisan", usually have a greater sedative effect, and the physician may take advantage of this. "Antistine" and "Histostab", "Neohetramine", "Thephorin", "Perazil" and "Diparalene" are less potent and less sedative. The physician is advised to choose one from each group and to become familiar with them for general use.

Specific Diseases.

Hay Fever and Vasomotor Rhinitis.—The antihistaminics are probably most effective for hay fever and vasomotor rhinitis. Observers report significant relief in from 50% to 80% of cases. The irritation and itching of the eyes and nose respond best, but rhinorrhœa is also decreased. Factors such as the intensity of the allergic stimulus and the chronicity of changes in the mucous membranes will modify the result. Local application with drops may be used but is often not as effective as that *per os*. The combined use of the drug with ephedrine drops or adrenaline spray is recommended for refractory cases.

Bronchial Asthma.—Results in bronchial asthma are disappointing, though reports suggest that an aerosol inhalation may be more effective. When hay fever and asthma occur together, it is sometimes observed that the former responds while the latter is unaffected. Whether this means that histamine plays no significant part in asthma or whether the histamine produced locally in the lungs is in such concentration as to render the antihistaminics ineffective is a matter for investigation. It has been shown, however, that the histamine content of the lungs is far in excess of that in any other tissue in the body.

Urticaria and Angio-neurotic Œdema.—One of the earliest and most successful applications was for such conditions as urticaria and angio-neurotic œdema. From 60% to 80% of persons affected receive benefit. Itching and irritation subside rapidly, but œdema takes longer. Local application may be tried but is often not as effective as oral administration. Adrenaline should be used as well in severe cases.

Drug Reactions.—Drug reactions respond well to antihistaminics, and it is sometimes possible to continue with the causal drug if its administration is urgent. This should be done cautiously, and when possible an alternative preparation should be used. Hunter and Hill (1947) have described the use of antihistaminics as a cover during the desensitization of patients to insulin and liver extracts.

Eczema, Atopic Dermatitis, Pruritus and Contact Dermatitis.—The antihistaminics are less effective for eczema, atopic dermatitis, pruritus and contact dermatitis than for urticaria. They sometimes provide symptomatic relief of the itching and thus prevent scratching and secondary infection. Local application is generally disappointing, but if it is used it is advisable to observe the effect on a small area of the lesion first.

Serum Sickness.—Partial relief of serum sickness is usually attained, particularly of the pruritus and œdema. The joint symptoms are more resistant, and other suitable drugs, such as ephedrine and salicylates, should be combined with the antihistaminic. As would be expected, the giving of antihistaminics is ineffective during the administration of the serum or during the incubation period.

Coryza.—The relief of nasal congestion in some types of rhinitis led to the belief that these drugs were of benefit in treatment of the common cold. However, extensive therapeutic trials in the United States of America and in the United Kingdom, and observations on experimental infections have disproved this.

Sea-Sickness, Morning Sickness, Radiation Sickness.—As a result of a chance observation, Gay and Carliner (1949) found that antihistaminics were of benefit in motion sickness, and subsequent investigations have confirmed their value. The combination of 8 chloro-theophylline with

TABLE II.
Related Compounds.

Trade Name.	Abbreviated Chemical Name.	Drug House.	Preparation.	Content.
"Andramine"	Diphenhydramine 8-chlorotheophyllinate.	Andrews.	Tablets.	50 milligrammes.
"Avomine"	Promethazine 8-chlorotheophyllinate.	May and Baker.	Tablets.	25 milligrammes.
"Dramamine"	Diphenhydramine 8-chlorotheophyllinate.	G. D. Searle.	Tablets.	50 milligrammes.
"Diparcol"	Diethazine hydrochloride.	May and Baker.	Tablets.	50 and 250 milligrammes.
			Ampoules (five millilitres).	50 milligrammes per millilitre.
"Menhydrinate"	Diphenhydramine 8-chlorotheophyllinate.	R. D. Toppin and Son.	Tablets.	50 milligrammes.

"Benadryl" ("Dramamine", "Andramine", "Travamine") and with "Phenergan" ("Avomine") has seemed to enhance their effectiveness. These preparations are also of value for some patients with other types of hyperemesis, including morning sickness and radiation sickness.

Parkinson's Disease.—"Benadryl" was reported by Budnitz (1948) to relieve the rigidity and tremor of Parkinson's disease, and subsequent reports have confirmed that antihistaminics provide symptomatic relief in some cases. "Diparcol", which is used with good effect in some cases, is closely related to the antihistaminics. The effect of "Artane" is also said to be enhanced by combination with an antihistaminic.

Acute Nephritis.—An early report (Craig *et alii*, 1949) suggested that "Benadryl" shortened the period of illness and prevented chronicity in cases of acute nephritis, but the series was small and subsequent reports have not confirmed the good results (Lawson, 1951; Thomson, 1949).

Toxicity.

Side effects of minor importance are common. Sedative effects occur in from 20% to 60% of cases with ordinary doses. It is more common with preparations of greater potency, such as "Phenergan" and "Benadryl". In many cases the physician can take advantage of this sedative action. It is obviously dangerous for car drivers, aeroplane pilots and others performing responsible work to take such preparations. With continued administration the drowsiness often passes off; but when it continues to be troublesome in spite of varying the preparation, combined use with amphetamine is recommended.

Less frequent are abdominal discomfort, nausea and vomiting. Nervous stimulation occurs in a few patients, who become talkative, nervous, apprehensive and restless. Dizziness, unsteadiness and tremors may occur.

Considering the widespread use of antihistaminics, both with and without medical prescriptions, serious toxic effects are very rare. A number of such cases have been reported, some apparently due to idiosyncrasy, others to overdosage.

Disorientation, delusions, confusion and delirium occurred in a woman after 2000 milligrammes of "Benadryl" taken in forty-eight hours. Recovery occurred forty-eight hours after suspension of the drug. Behaviour disorders, muscle twitchings, labyrinthitis, blurred vision and the precipitation of fits in epileptics have been reported.

Agranulocytosis has occurred, in one case after the taking of "Anthisan" for three weeks, with "Pyribenzamine" on a number of occasions, and with "Diatrin". Hæmolytic anæmia has occurred after the administration of "Benadryl" and "Pyribenzamine".

Various types of allergic skin rashes have been reported, though no cases of severe exfoliative dermatitis.

There is an increasing number of reports of fatalities, mostly in infants. It has been frequently pointed out that the dispensing of antihistaminics as attractively coloured sugar-coated dragees is dangerous in this respect. Fatal doses of 100 milligrammes of "Thenylene", 400 milligrammes of "Benadryl" and 600 milligrammes of "Anthisan" have been reported in children under the age of two years.

Fatal symptoms are convulsions, respiratory depression, hyperpyrexia and coma. Death occurs in from one to twenty hours.

There is little in the way of data on effective treatment. Symptomatic measures, either sedative or stimulant, have been generally used. In a leading article *The Lancet* (Editorial, 1950) suggests the subcutaneous injection of histamine acid phosphate in doses of one milligramme per kilogram.

Conclusion.

It may be concluded that the introduction of the antihistaminic drugs has made a very real addition to the all too scanty therapeutic resources of the doctor.

There is no doubt that they have been abused. This is inevitable when their use is directed to the extensive and ill-defined field of allergy. Their unlimited sale over the counter has also contributed to excessive and misplaced usage.

On the other hand, there is little doubt that in many cases they have been wrongly discarded as useless because they have not been used intelligently.

It is clear that finding the right dose of the right preparation for the right patient constitutes a problem for the physician, the solution of which may be fairly called the art of treatment.

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British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held on July 24, 1952, at Saint Vincent's Hospital, Sydney. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staffs of the hospital.

Multiple Myeloma.

DR. J. E. SHERWOOD presented a married woman patient, aged sixty-eight years, suffering from multiple myeloma with hiatus hernia. He said that she had been in comparatively good health until five months before her present admission to hospital on June 3, 1952. At that time she had developed "backache" while performing her household duties. The pain was at first slight, but later it became severe and she became bedridden. The pain had now become continuous; it did not radiate, but was aggravated by movement. More recently it had been present in her loins, usually worse on the left side. Off and on, for about four months, she had been suffering from anorexia and vomiting, the latter occurring after each meal. She had had frequent attacks of heartburn, palpitation on exertion and occasional bouts of epistaxis. In 1944 she had undergone hysterectomy for carcinoma of the uterus. When examined on admission to hospital, the patient was noticeably pale and complained of intense pain in the region of the lumbar part of the spine on slight movement. Her heart was not obviously enlarged, but her blood pressure was 200 millimetres of mercury, systolic, and 110 millimetres, diastolic. The lungs were apparently normal, the liver was palpable, but there was no enlargement of the spleen or lymph glands. A blood count revealed 2,550,000 erythrocytes per cubic millimetre, a hæmoglobin value of 7·9 grammes *per centum* (58%), a hæmatocrit reading of 22%, a mean corpuscular volume of 86 microns, a mean corpuscular hæmoglobin concentration of 36%, and a colour index of 1·03. The leucocytes numbered 5200 per cubic millimetre, 74% being neutrophile cells. The platelets were within normal limits. The urine contained a faint cloud of albumin, but no Bence Jones protein was detected. Bone marrow biopsy on June 16, 1952, revealed that the marrow

contained numerous plasma cells resembling those of myelomatosis, and having eccentric nuclei and basophilic cytoplasm. The plasma cells made up 5% to 10% of the total nucleated cells. Other cells of the red and white series showed no obvious abnormality. The erythrocyte sedimentation rate on June 23 was 29 minutes in one hour; considerable rouleaux formation was noted. Urine examination on June 24 revealed the presence of a small amount of protein thrown out of solution at 44° C., which did not coagulate or disappear on boiling. It was not typical of Bence Jones protein, but it was not ordinary albumin. It was apparently a globulin-like protein related to, but not identical with, Bence Jones protein. The serum phosphorus content was within normal limits, but the serum calcium content was increased to 15 milligrammes *per centum*. The total serum protein value was 7·5 grammes per 100 millimetres, the albumin being decreased to 4·4 grammes, and the globulin increased to 3·1 grammes. It was found that the blood picture improved only with blood transfusion, otherwise relapses occurred. The injection of stilbamidine, 150 milligrammes in procaine hydrochloride solution, brought striking symptomatic relief of pain. The injections were given every second day. Although after eight injections the patient was pleased to be relieved of them, she was quite anxious to resume the course when pain recurred. Dr. Sherwood referred to the possible toxic effects of stilbamidine, namely, fall in blood pressure and dissociated anæsthesia of the trigeminal nerve occurring several months after treatment. X-ray examination of the patient's spine revealed many small areas of destruction through the whole skeleton. All the ribs, all the vertebræ and the pelvic bones were involved. Pathological compression fractures had occurred through the twelfth dorsal and first lumbar vertebræ. The radiologist reported that the appearance strongly suggested a malignant neoplasm, probably a multiple myeloma. Scattered, punched-out areas of destruction were noted in the skull and also in the long bones, including the radius and ulna. In this case the radiologist reported that radiological appearances were more suggestive of multiple myeloma than of carcinomatosis, although it was not possible to exclude the latter condition, especially in view of the patient's history. X-ray examination of the œsophagus, stomach and duodenum revealed a sliding, hiatal hernia.

Erythrocythæmia.

Dr. Sherwood then presented three patients suffering from erythrocythæmia. The first patient had been presented at a British Medical Association meeting at the hospital some five years previously. She was, at the time of the meeting, an in-patient of the hospital recovering from a recent attack of congestive cardiac failure. She had originally presented with a duodenal ulcer and hæmatemesis. Ruddy cyanosis and splenic enlargement, with a typical blood picture, had confirmed the diagnosis of erythrocythæmia. Her condition had been fairly well controlled over a period of years by preliminary X-ray therapy, followed later by venesection only, reliance being placed chiefly on the hæmatocrit reading as an indication for the need for venesection. Venesection had not been required for periods extending up to twelve months. The patient had undergone an extensive pelvic plastic operation during her illness without undue disturbance. Dr. Sherwood said that one of her chief present disabilities was a degree of splenic enlargement, which had been greater in recent months than formerly, and she was having X-ray therapy for it.

The second patient, a man, aged sixty-eight years, had presented with an X-ray picture very suggestive of carcinoma of the greater curvature of the stomach. Clinical findings of splenomegaly, ruddy cyanosis and a characteristic blood picture had confirmed the diagnosis of erythrocythæmia. Gastroscopic examination and the subsequent progress of the patient's condition excluded the possibility of gastric carcinoma. Dr. Sherwood said that another interesting occurrence in the patient's history was the removal of the left testis in 1950 by Dr. P. J. Kenny for the condition of seminoma. Though the patient had had subsequent X-ray therapy, the possible ætiological relationship of that therapy to the patient's present condition was excluded. Treatment by venesection had been commenced.

The third patient, a woman, aged thirty-three years, had erythrocythæmia of fairly recent origin. Adequate investigation had been impossible owing to the elusive nature of the condition in that particular case. However, ruddy cyanosis had been noticeable and two blood counts at intervals of five months had been indicative of erythrocythæmia. No splenic enlargement had been detected. Dr. Sherwood said that progress would probably further substantiate the diagnosis of erythrocythæmia.

Leucotomy for the Relief of Pain.

DR. DOUGLAS MILLER presented a man, aged sixty-two years, who had undergone leucotomy for intractable obsessional pain. Dr. Miller said that for eight years the patient had had pain from the inside of his mouth, but the pain occasionally involved the left side of his face as well as the right. It was described as a continuous, sharp pain occurring without remission for days on end and reaching maximum intensity at night. Frequent injections of morphine were required for its relief. The patient was described by his doctor as being "at the end of his tether". On admission to hospital, the patient was pale and exhausted, held the side of his face continuously, and was completely absorbed by his pain. There were, however, no objective signs of abnormality in the central nervous system. Unilateral leucotomy was performed on the right side with immediate relief of the pain. The atmosphere of the patient's home was completely changed, but his doctor and family reported that there were no personality changes and relief had been dramatic. The patient still had occasional short bouts of pain, which did not require treatment for their relief.

Aortic Thrombosis.

Dr. Miller also presented a man, aged sixty years, who had suffered from intermittent claudication for many years. In April, 1946, the patient had had a severe attack of pain while he was at rest, the pain being down the back of both legs as far as the calves. He was an invalid for ten months, but improved slightly and eventually resumed light work, though with great difficulty. Examination revealed that his activity was greatly restricted. Both legs were discoloured and cold. No peripheral vessels were palpable in either lower limb. His blood pressure at that time was 230 millimetres of mercury, systolic, and 105 millimetres, diastolic. Bilateral lumbar sympathectomy was proposed, and a mid-line incision was made, so that the patient's great vessels could be seen. When the aorta was exposed, no pulsation could be felt. Two very small common iliac arteries were present, but neither was pulsating. The lumbar sympathetic chains were removed on both sides with great benefit to the nutrition of the limbs and the activity of the patient.

Craniostenosis.

DR. J. L. DOWLING presented a child, aged five years, suffering from craniostenosis. Dr. Dowling said that the birth of the child had been difficult, and the child had apparently suffered some injury by forceps manipulation during the labour. The eyes were always prominent, and there was obvious asymmetry of the face, the left side being somewhat flatter than the right. However, the child was unusual in that she was mentally quite normal. X-ray examination showed absence of all sutures between the bones of the skull and the "silverbeaten" appearance due to chronically raised intracranial pressure. Dr. Dowling said that various methods of surgery were in use for the treatment of the condition, but for the child presented an attempt was being made to re-create sutures in a normal position. Eventually, decompression of the orbits might be necessary. Dr. Dowling said that mental deficiency was the contraindication to surgery, but in the case under consideration, though the child was five years of age, she was mentally quite bright and therefore operation should prove quite satisfactory.

Subarachnoid Hæmorrhage and Intracranial Aneurysm.

Dr. Dowling's second patient was a man, aged thirty-seven years, who on June 15, 1951, had suffered a spontaneous subarachnoid hæmorrhage followed by left hemiplegia. A carotid angiogram was prepared one month later, the right common carotid artery being used. This showed an aneurysm on the proximal part of the right anterior cerebral artery, which was clearly seen on both the lateral and antero-posterior films. The films were demonstrated at the meeting. Ligation of the right common carotid artery was carried out with the object of promoting thrombosis within the aneurysmal sac. The patient's condition improved considerably thereafter, and two months later, when angiography was repeated, the right internal carotid artery being used, there was no evidence of aneurysmal dilatation and a normal anterior cerebral artery was seen. At the time of the meeting the patient was quite well and earning his living. He had a slight residual spastic weakness on the left side.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

ABUSE OF MEDICAL CHARITY IN THE COLONY.[1]

[*Medical Record of Australia*, Melbourne, July 25, 1862.]

The "Argus" of July the 5th contains a most able leading article on the late Legislative grant to charitable institutions. The writer states that "In the year 1856 when the population of Victoria numbered 350,000, the Government expenditure in aid of useful and charitable institutions amounted to £13,780 9s. 3d. For the year 1862 with the population only augmented by 50 per cent. the Legislature has voted £83,750 to these objects. In other words we propose to expend six times as much in public charity as we did six years ago without any commensurate increase in the claims on our bounty. For it will scarcely be contended that there are six times as many destitute sick persons seeking admission into our benevolent hospitals and asylums as there were in 1856. Medical assistance is far more accessible than formerly, domestic comforts are more attainable and the social position of our population has greatly improved within the last half a dozen years. At one time the labouring man who fell ill had no alternative but the hospital. Surgical advice was beyond his reach, and the miserable lodging house which he occupied, in common with a dozen other inmates, was devoid of every appliance that could solace suffering or assist recovery. Since then our population has become more settled and domesticated, medical practitioners are to be met with in every township, and the number of really deserving cases presenting themselves for relief at our hospitals ought to be fewer, instead of more numerous than heretofore. But in truth, public benevolence is abused, and the charitable institutions subsidized by the State are taken advantage of by the class of persons for whose benefit they were never intended. One case has come to our knowledge in which an individual deriving a thousand a year from the rental of suburban property became an outpatient at the Melbourne Hospital: and it is well known to every medical man that numbers of persons in easy circumstances avail themselves of the medicine and advice gratuitously offered at the various hospitals in the Colony."

The profession is under great obligations to the writer for drawing the attention of the public to the subject, for, as he very justly observes "an act of gross injustice is committed both to the profession and the public, inasmuch as it deprives the former of many patients who are perfectly well able to pay for advice and medicine, and it enhances the cost of both these to the rest of the community: since the members of the faculty are obliged to adopt a higher scale of charges towards their private patients in order to compensate them (the physicians and surgeons) for the time and attention they gratuitously devote to the hospitals in which they occupy honorary offices. Admirable as those institutions are in theory, and beneficent as they undoubtedly are in operation, they nevertheless tend in some degree to exercise a demoralizing influence, by encouraging people to become the recipients of charitable assistance who ought to be perfectly independent of such aid".

The evil, for such it is, and a very gross one, pressing as heavily on members of the hospital staffs as on those who have no connection with the institutions, perhaps more so: for patients who can get their advice for nothing at the hospitals will not go to their houses and pay them fees—can be easily remedied. If the hospital staff were to give up the power of admitting patients, except they were out-patients, they would get rid of the importunity of those who come and pay them a fee that they might be admitted into the hospital, although able to pay, and the sarcastic remarks of the other members of the profession and the public, that when they had fleeced their patients, and were unable to cure them, they sent them into the hospitals, for the subscribers and the State to keep, and the resident medical officers to cure. And further if the hospital Committees were to append a notice to the letters of recommendation requesting subscribers not to give the letters to persons in employment or in a position to pay for medical aid, they would either put a stop to, or check the system now so common, of men in receipt of good wages and people in good circumstances of dishonestly availing themselves of the labour of the hard worked and poorly paid medical man.

No other body of men work so hard, and do so much for nothing, as the members of the medical profession. There is no reason for their doing this. Let them give their services to the poor, by all means, but not to those who are better off than themselves. They have only to make a stand against the present system of persons being allowed to seek relief at the hospitals without reference as to whether they are proper objects for it or not, to break it up: for if they allow it to go on, they will someday find themselves pauper doctors, with only pauperised patients to attend, for it is quite certain that if a person once becomes an hospital patient, he will never afterwards pay for medical attendance if he can possibly avoid it.

[1] From the original in the Mitchell Library, Sydney.

Correspondence.

THE LATE DR. F. C. EVE.

SIR: I pass on the following information for what it is worth.

The late Dr. F. C. Eve, M.D., F.R.C.P., who passed away at Beverley, Yorkshire, on December 7, 1952, was perhaps best known for his work on artificial respiration and the Eve rocking stretcher. He was also author of many papers on different branches of his work.

However, it is little known that it was he who, when a resident at Saint Thomas's Hospital, London, in the late 1890's, first suggested that patients should be nursed in fresh air instead of within the closed and stuffy wards of the hospital.

It was whilst I was walking with his son, Dr. Ivor Eve, along the Thames Embankment past St. Thomas's Hospital during the summer of 1950 that he told me how his father after much opposition persuaded his chiefs to allow him to put their patients on the small verandas overlooking Westminster and the river.

Yours, etc.,

ALAN L. LANGLEY.

Lithgow,
New South Wales,
February 22, 1953.

PROLONGED LOCAL ANÆSTHESIA IN OPERATION WOUNDS.

SIR: The recurrent Press reports of a new long-acting local anæsthetic for operation wounds will excite the interest of both patient and surgeon. It may, therefore, be of some value if I record my experience, limited though it be, with the drug "Efocaine", mentioned in the lay Press, and a recent Australian product, "Andolor", Grosvenor Laboratories, Sydney, of similar properties and composition.

One hundred cubic centimetres of "Efocaine" were used in 16 operation wounds, and 150 cubic centimetres of "Andolor" in 20 operation wounds, in accordance with the manufacturer's instructions. Injection was made about nerves, into aponeurotic layers or diffusely in the deep tissues (for example, perianal). Doses as small as two cubic centimetres were adequate for intercostal nerve block, while eight to ten cubic centimetres were necessary on abdominal and anal wounds.

The post-operative comfort of the patient is undoubtedly increased by the use of these substances, and no difference can be detected thus far between the imported and local products. Deep tenderness is not abolished, but for at least a week post-operative pain is so reduced as to permit coughing, deep breathing, movement, ambulation *et cetera*. The absence of pain in abdominal and tonsillar and iliac (bone graft) wounds is very striking. Failure in many cases was associated with timid use of the drug.

I have not yet had the opportunity to observe its effects in periarticular tissues (knee joint, metatarso-phalangeals, metacarpo-phalangeals *et cetera*). Its properties are of value in fibrous nodules, sprains, tears and ruptured aponeuroses.

The increased strain placed on certain wounds (hernia and paramedian) has made me feel that such wounds should be closed by non-absorbable sutures (braided "Nylon" or stainless steel wires).

Clinical trials are still in progress with the Australian product "Andolor", but, on present indications, the preparation is thoroughly successful. Accordingly, wide experience of interested surgeons, prepared to use the drug with care and precision, is now necessary for its further evaluation.

I am informed that the price of the Australian product (about 15s. per 10 cubic centimetre phial) compares more than favourably with the American product ($4.25 per 20 cubic centimetre phial).

No embarrassment in healing has occurred in any of the wounds. Care should be exercised to see that the syringe is free of water and methylated spirit, or precipitation may occur in the solution. An intravenous needle on a 10 cubic centimetre syringe permits ready injection without force.

It is my present impression that the method represents a definite contribution to the post-operative comfort of the patient, but its final place in the surgical armamentarium awaits a greater experience.

Yours, etc.,

149 Macquarie Street, Sydney,
February 19, 1953.

KENNETH W. STARR.

ON THE RECTAL ADMINISTRATION OF SODIUM THIOPENTONE TO CHILDREN.

SIR: It was a pleasure to read Dr. Ian McDonald's article "On the Rectal Administration of Sodium Thiopentone to Children" published in the journal of February 7, 1953.

As an anæsthetist who has been using the technique, described by Dr. McDonald, for years, I regret that its use has been so much neglected. One has only to contrast the ease of induction of a child sleeping quietly under the effect of rectal thiopentone with the bludgeoning into unconsciousness of a terrified and struggling child so often seen, to realize what a great advantage to both anæsthetist and patient this method can be. The child has no unpleasant recollections of his anæsthetic, and the post-anæsthetic period is likewise much smoother. As the technique is simple, it can be used by any practitioner willing to learn it and to take the little extra trouble of practising it.

I trust that Dr. McDonald's article will lead to a more widespread use of rectal thiopentone and thus reduce the psychological trauma inflicted on young children and the number who are thereafter afraid of their doctor.

Yours, etc.,

55 Collins Street, Melbourne,
February 15, 1953.

J. CATARINICH, JUNIOR.

OLD CASE-BOOKS OF THE (ROYAL) ADELAIDE HOSPITAL.

SIR: In 1924 the case-book system of records at the then Adelaide Hospital was replaced by folders. These ponderous volumes occupied much space, and in 1948 the board of the hospital decided to retain them no longer. The archives branch of the Public Library was asked whether it wanted any portion conserved. The archives pointed out that they had no room available, and moreover the interest was more medical than purely historical. The medical library at the university also had no space available for such a mass of records—or indeed even for a sample of them. Feeling that something should at least be saved, my assistant, Mr. E. J. Rogers, and myself decided to select one case-book for each year, varying the honorary concerned and the subject. We hoped in this way to have a selection of case-books illustrating the progress made in various branches of medicine over the earlier years of this hospital. Still faced with a place for the disposal of the selected case-books, we were able to prevail on Professor A. A. Abbie to house them in the department of anatomy. There they are at present in the cupboards of one of the research rooms. The medical library of the university is listing them under "Royal Adelaide Hospital case notes, 1864-1923", and the entry indicates their present location. The archives department of the Public Library of South Australia is cross-referencing them in a similar fashion. As the medical historian of the future may wish to consult case-books such as these, and may not know of their existence or where they are kept, it has seemed advisable to make a reference to them, and one that would be indexed, in THE MEDICAL JOURNAL OF AUSTRALIA. The case-books retained consist of the following:

1864-1880, all volumes.
1881, Dr. J. D. Thomas (2).
1882, Dr. E. W. Way (2).
1883; Dr. Wm. Gardner (2).
1884, Dr. Chas. Gosse (2).
1885, Dr. S. K. Ellison.
1887, Dr. E. C. Stirling.
1888, Dr. J. C. Verco.
1889, Dr. M. J. Symons.
1890, Dr. B. Poulton.
1891, Dr. W. A. Giles.
1892, Dr. A. A. Lendon.
1893, Dr. T. K. Hamilton.
1894, Dr. J. C. Verco.
1895, Dr. A. A. Hamilton.
1896, Dr. A. D. L. Napier.
1897, Dr. W. Ramsay-Smith.
1898, Dr. R. S. Rogers.
1899, Dr. L. W. Bickle.
1900, Dr. W. Ramsay-Smith.
1901, Dr. W. T. Hayward.
1902, Dr. A. E. Shepherd.
1903, Dr. J. A. G. Hamilton.
1904, Dr. B. Poulton.
1905, Dr. W. A. Giles.
1906, Dr. A. M. Cudmore.
1907, Dr. F. W. Niesche.
1908, Dr. J. C. Verco.
1909, Dr. C. E. Todd.
1910, Dr. Harry Swift.
1911, Dr. E. A. Johnson.
1912, Dr. T. G. Wilson.
1913, Dr. A. W. Hill.
1914, Dr. A. H. Gault.
1915, Dr. G. A. Fisher.
1916, Dr. R. W. Harrold.
1917, Dr. H. F. Shorney.
1918, Dr. C. T. de Crespigny.
1919, Dr. A. M. Cudmore.
1920, W. R. Cavanagh-Mainwaring.
1923, Dr. Wm. Ray.

Yours, etc.,

Adelaide,
February 10, 1953.

J. B. CLELAND.

IDIOTS SAVANTS AND POLITICIANS.

SIR: Surely the reviewer of Tredgold's "A Text-Book of Deficiency (Amentia)" has missed the point when he says: "The chapter on *'idiots savants'* makes fascinating reading for anyone and may serve to explain the behaviour of certain of our legislators." The *idiot savant* with one or two remarkable but unmarketable aptitudes and woefully lacking in common sense and general intelligence sooner or later becomes a guest of the State. The legislator on the contrary with his pickings, perquisites and pension manages to support himself (or is supported) very comfortably. Who has ever met a poor legislator, that is, poor in a material sense? Admittedly, "idiot" is one of the less objectionable epithets hurled about at the hustings, but who are we psychiatrists, and I assume that your learned reviewer is of that ilk, to anticipate the judgement of posterity by classing "certain of our legislators" with idiots, not just plain or hyphenated but *savants*? What said the Compte de Maistre? *"Toute nation a le gouvernement qu'elle mérite."*

Yours, etc.,

Sydney,
February 14, 1953.

W. S. DAWSON.

THE SPLENIC FLEXURE SYNDROME.

SIR: In your issue of the journal dated February 7, 1953, you published in the "Current Comment" pages a most interesting abstract of an article on the "splenic flexure syndrome". The main purpose of this article is to draw attention to the fact that patients with this disorder of physiology are apt to be diagnosed as suffering from coronary artery disease and forthwith be deprived by the physician of many of the activities and pleasures of life. It is the purpose of this letter to point out that this condition of the colon (well named "irritable colon" by Sippy) may also cause confusion in diagnosis in the realm of the surgeon below the diaphragm. The gall-bladder in particular is in grave danger. The patient actually suffering from irritable colon frequently complains of a feeling of fullness and vague discomfort after meals and of constipation. Such a symptom-complex is enough to render his gall-bladder suspect and to set in motion a series of steps which may lead to cholecystectomy. In this case yet another recruit has been added to that unhappy band of patients clumped together under the doubtful label of "post-cholecystectomy syndrome".

Looking through my case records of "surgical dyspepsias" made in the last five years, I came across five or six in which the final diagnosis was spastic (or irritable) colon. These patients had all been referred for surgical opinion with a view to operation. The following summary of one case will serve to illustrate the remainder:

A man, aged forty-five, weighing 14 stone, complained of swelling in the epigastric region after meals for some five

years. This tended to be worse at night, when dry vomiting would occur, or even "bile" was observed. At other times he complained of a gnawing sensation in the pit of the stomach after meals, with a feeling of sickness. He had suffered from severe constipation for many years and was "always taking opening medicine". No lesions could be found in the stomach, duodenum or gall-bladder. The report on a barium enema stated: "Well marked spasticity of descending colon with narrowing of this part of the bowel." This patient suffered from an anxiety state, and he was much improved by treatment under a physician, which included cascara, minims 25, belladonna, minims 10, and bromide, grains 10.

The medical management of such a patient is apparently not easy, but at least he should be spared the shock of a ravishing hand inside his already tremulous abdomen.

Yours, etc.,

Sydney,
February 11, 1953.

JAMES MACRAE YEATES.

Obituary.

JOYCE SELDON STOBO.

JOYCE SELDON STOBO was born at Pymble, New South Wales, on February 11, 1899. She spent all her school days at Ravenswood College, and from the beginning showed evidence of her brilliant mind and aptitude for study. Her early love for the classics and languages developed and throughout her life she remained a keen reader and student of history. She greatly loved music, and having shown some evidence of this at a very early age, began lessons in this subject when only five years old; and a little later learnt also singing, dancing and drawing which developed her keen appreciation and delight in the lovely and gracious things of life.

In the Junior Examination she won the Fairfax Prize for New South Wales and Queensland with the highest pass that had been recorded up to that time. After passing the Senior Examination with hônours she began her study of medicine at the University of Sydney in 1918. She passed well in her medical course, and won "distinction" in first year and in third year, "credit" in the year finals. In the Senior Year Book of 1922 she is described as: "Of an unobtrusive and modest personality, Miss Stobo is liked and admired by all who meet her."

After graduating in 1923 she was appointed resident medical officer at the Women's Hospital, Crown Street, Sydney, and remained there for seven months. She was then appointed resident medical officer to the Hospital for Sick Children, Brisbane, and followed on from this to the Brisbane General Hospital. After completing her residentship there and having done some country "locums" she decided to commence practice in Brisbane and in 1926 took rooms in Ballow Chambers, Wickham Terrace, a building which was being erected at that time. At first she lived at Montpelier, Wickham Terrace, and later commenced practice in East Brisbane, and still carried on the Ballow Chambers practice. She was honorary out-patients' orthopædic surgeon at the Brisbane Children's Hospital from 1926 until 1936, when she became an honorary medical officer at the Brisbane Women's Hospital. This was work she greatly enjoyed and she remained on the visiting staff of this hospital until her death. She undertook all types of work in her practice, but her main interest was the welfare of the mothers and babies. In 1942 she was registered as a specialist obstetrician.

In July, 1928, she became the Queensland representative of the Editor of this journal, and held the position with credit to herself and benefit to the Queensland Branch of the British Medical Association until June, 1943. For many years she was a member of the Council of the Australasian Trained Nurses Association, Queensland Branch, and she took a keen interest in this and the Massage Association. She was Past-President of the Queensland Medical Women's Society, a position which she held on several occasions, the last being in 1950, the year in which the Australasian Medical Congress (British Medical Association) was held in Brisbane. She was a member of the Council of the Junior Red Cross. For the past few years she has been an active member of the Marriage Guidance Council.

Joyce Stobo had a very rare personality, and with her complete sincerity there was combined an inner dignity and reserve, a great moral and physical courage, an independence of spirit and strength of character. Having high ideals and a strongly developed sense of duty she demanded from herself, and inspired in others, high standards in the art of living, but having been blessed with a fine and rational mind and an understanding heart, her sympathetic understanding of human frailties endeared her to her patients, as also did her keen and responsive sense of humour and ready laughter. Affectation, hypocrisy and injustice quickly aroused her impatience and indignation. She had an intense and unflagging interest in people, and a keen sympathy with suffering, and showed complete abnegation of self, sacrificing her own health for her work, which she loved, and which gave her very great satisfaction.

She was a lover of beauty in all forms; music and books, colour and scenery gave her great delight. She loved when possible to work in her garden, shaded by her beloved trees, and companioned by "Dinah", her black cocker spaniel.

In 1951 she travelled abroad for twelve months, thus realizing a life-long ambition to visit the Old World. Driving in their own motor-car, she and her friends travelled more than thirteen thousand miles in Britain, France, Switzerland, Italy, Austria, Germany, Holland, Belgium and Norway. Her wide knowledge of history, places, and things was a revelation to her companions and greatly enhanced the pleasure and interest of the journey. She was fascinated with northern Italy, particularly with such places as Siena. In Britain her interest in cathedrals, old buildings, historic houses and castles was equalled only by her delight in the green countryside, the trees and gardens. One of the highlights of her travels was her visit to the village of Stobo, near Peebles in Scotland, whence her ancestors came. Stobo became, in the lifetime of Saint Mungo, who died in A.D. 603, Church property. The primitive masonry of a church existing in these early times has been preserved as Saint Mungo's cell and chapel, and as part of the present Norman church (*circa* A.D. 1140) which was dedicated to Saint Mungo. Stobo Kirk, as it is known today, is the Mother Church of Upper Tweeddale. Another happy memory for her was of the gardens of Stobo Castle, with their glorious rhododendrons.

While in London in June, 1951, she represented the Queensland Branch at the one hundred and nineteenth annual meeting of the British Medical Association.

During the last ten years her health had been causing worry, and her holiday abroad had appeared to have restored her health in some measure, and given her the rest she so badly needed. She collapsed in her surgery at home on Friday evening, October 17, and died in Saint Martin's Hospital, Brisbane, on October 19 without regaining consciousness.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Advanced Neurology.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a course in advanced neurology will be held from Monday, April 13, to Friday, May 1, 1953, when Dr. Macdonald Critchley will conduct the following programme:

Monday, April 13: 4 p.m., clinic, Sydney Hospital; 8.15 p.m., "Thought and Language", Stawell Hall, 145 Macquarie Street, Sydney.

Tuesday, April 14: 4 p.m., clinic, Royal Prince Alfred Hospital.

Wednesday, April 15: 12 noon, "Disseminated Sclerosis", Maitland Lecture Theatre, Sydney Hospital; 3 p.m., clinic, Royal North Shore Hospital of Sydney.

Thursday, April 16: 8.15 p.m., "The History of European Neurology", Stawell Hall.

Friday, April 17: 1.15 p.m., "A Restatement of Encephalitis", Royal Prince Alfred Hospital.

Monday, April 20: 4 p.m., clinic, Sydney Hospital; 8.15 p.m., "Headache", Stawell Hall.

Tuesday, April 21: 4 p.m., clinic, Royal Prince Alfred Hospital.

Wednesday, April 22: 12 noon, "Cerebral Arteries and Their Syndromes", Maitland Lecture Theatre, Sydney Hospital.

Friday, April 24: 1.15 p.m., "Cerebral Disorders of Vision", Royal Prince Alfred Hospital; 8.15 p.m., "The Neurology of the Hand", Stawell Hall.

Monday, April 27: 4 p.m., clinic, Sydney Hospital; 8.15 p.m., "The Body Image in Neurology", Stawell Hall.

Tuesday, April 28: 4 p.m., clinic, Royal Prince Alfred Hospital.

Wednesday, April 29: 12 noon, "The Parietal Lobe", Maitland Lecture Theatre, Sydney Hospital; 3 p.m., demonstration, Northcott Neurological Centre, 11 Lytton Street, North Sydney.

Friday, May 1: 1.15 p.m., "Disorders of Language", Royal Prince Alfred Hospital; 8.15 p.m., "Neurological Aspects of Criminology: (i) The Crimes of Dr. Marcel Petiot; (ii) Peter Kurtein, the Mass-Murderer of Dusseldorf", Stawell Hall.

Fee for attendance is £6 6s. for members of the subscription course, and £7 7s. for non-members. Written application, enclosing remittance, should be forwarded to the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones BU 5238, BW 7483.

Annual Subscription Course: Overseas Lecturer.

The Post-Graduate Committee in Medicine in the University of Sydney announces that Dr. Bernard Johnson, D.A. (England), Dean of the Faculty of Anæsthetists, Royal College of Surgeons of England, will be visiting Sydney in March, 1953.

On Monday, March 30, at 8.15 p.m., in the Stawell Hall, 145 Macquarie Street, Sydney, he will speak on "Some Recent Developments in Anæsthesia".

The annual subscription course covers attendance at lectures by overseas visiting lecturers, and a monthly diary card is posted to all subscribers. An annual charge of £2 2s. covers all such lectures during the year, from July 1 to June 30. The fee for resident medical officers is £1 1s. Subscriptions are deductible for taxation. Further inquiries may be made from the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney. Telephones: BU 5238, BW 7483.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED FEBRUARY 7, 1953.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	4(3)	1(1)	..	..	1(1)	..	..	..	6
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	2	..	2
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	9(6)	2(1)	7(6)	..	2(1)	1	..	..	21
Diphtheria	21(11)	5(2)	3(1)	..	1(1)	1	..	..	31
Dysentery (Bacillary)	..	..	1(1)	1(1)	2(1)	..	..	..	4
Encephalitis	..	3(3)	..	1	..	..	..	..	4
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	1	..	..	..	..	..	..	1
Infective Hepatitis	..	1	..	..	12(12)	..	..	..	13
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	1	..	1
Leptospirosis	..	..	3	..	..	..	..	..	3
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	1	1	..	..	1(1)	..	..	..	3
Ophthalmia	..	..	..	..	2	..	..	..	2
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	36(14)	17(9)	5(2)	15(9)	3(2)	13(6)	..	..	89
Puerperal Fever	..	1	..	1	..	..	..	..	2
Rubella	..	23(15)	..	..	3(2)	..	..	..	26
Salmonella Infection	..	..	..	..	..	..	..	..	..
Scarlet Fever	13(6)	26(15)	..	2(2)	2(2)	..	..	..	43
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	1	..	..	..	..	..	1
Trachoma	..	..	..	..	..	..	..	..	..
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	27(24)	22(10)	7(4)	7(6)	11(4)	3(1)	..	1	78
Typhoid Fever	..	..	2	..	..	1	..	..	3
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

Corrigendum.

AN error appears in the paper entitled "The Influence of Barbiturate on the Central Nervous System", by E. R. Trethewie, which was published in the issue of January 24, 1953. On page 104, in the last line of the fourth paragraph, the first word "control" should read "cortical". The concluding sentence of the fourth paragraph will then read: "We do not discuss here cortical effects of barbiturates." We regret this error.

Deaths.

THE following deaths have been announced:

DOYLE.—Leo Doyle, on March 3, 1953, at Melbourne.

TELFER.—Archibald Craig Telfer, on February 20, 1953, at Sydney.

Congresses.

PAN-PACIFIC SURGICAL CONGRESS.

THE executive officers of the Pan-Pacific Surgical Association announce that the sixth Pan-Pacific Surgical Congress will be held in Honolulu in October, 1954. Included in the scientific programme will be sessions in all divisions of surgery and related fields, with papers presented by top-flight surgeons from the Pacific area countries. For further information concerning the sixth congress or membership in the Association, doctors may write to the Pan-Pacific Surgical Association, Suite 7, Young Hotel Building, Honolulu, T.H.

Nominations and Elections.

THE undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Barber, Eric Frederic Thomas (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Beavis, Ian Ramsay (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Bonamy, Ronald Dakin (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Calderbank, Dorothea Lorrette (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Castle, John Lindsay (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Cookson, Colin Jack Cartwright (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Coull, Marcus Allan (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Courtney, George John (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Fallon, Arthur John (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Franklin, Robert Arthur (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Geddes, Peter John (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Glasson, John Godfrey (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Goodwin, Isla Jean (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Gray, Donald Findlay (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Hansman, David John (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Harrington, John Dennett (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Harris, Grahame Harry (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Hassard, William Wallace (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Heber, Kenneth Royce (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Hird, Joy Stuart (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Hughes, Raymond Maldwyn (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Inglis, Malcolm John (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Lazarus, Leslie (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Leckie, Donald Norman (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); LeGuay, John Lawrence (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); McCullagh, Stanley Forster (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); McDonald, Donald Raymund (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); McLachlan, Prudence Ann (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Marshall, Brian Hamilton (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Morrison, Estelle Rita (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Mynott, Valerie Joy (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Purchas, Guyon Maurice (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Richardson, Raymond Proudlock (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Robinson, Douglas James (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Sim, Robert George Robertson (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Solomon, John Ridley (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Springhall, Rodney William (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Thompson, Ross William Grimmett (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Whitfeld, John Russell (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Willcock, Joan Violet (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Wise, William Lyon (prov. reg.), M.B., B.S., 1953 (Univ. Sydney); Farrell, John Campbell, M.B., B.S., 1952 (Univ. Sydney); Kirkland, Thomas Hamilton Speirs, M.B., B.S., 1951 (Univ. Sydney); Lee. Joseph Julius, M.B., B.S., 1946 (Univ. Sydney); O'Sullivan, Brian Francis, M.B., B.S., 1951 (Univ. Sydney); Knossew, Isidor Sigmund, registered in accordance with the *Medical Practitioners Act*, 1938-1945, Section 17 (*b*); Paterson, Norman Roy, M.B., 1921 (Univ. Sydney).

Diary for the Month.

MARCH 16.—Victorian Branch, B.M.A.: Finance Subcommittee.
MARCH 17.—New South Wales Branch, B.M.A.: Ethics Committee.
MARCH 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MARCH 18.—Western Australian Branch, B.M.A.: General Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital: all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

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